HCD-SD1

SERVICE MANUAL

AEP Model
UK Model
E Model

HCD-SD1 is the amplifier, CD and tuner section in CMT-SD1.

CD SECTION	Model Name Using Similar Mechanism	HCD-MD313
	Mechanism Type	CDM13B-5BD19
	Base Unit Type	BU-5BD19
	Optical Pick-up Type	KSS-213B/K-N

SPECIFICATIONS

Amplifier section

European model:
DIN power output (Rated)
20 + 20 watts
(6 ohms at 1 kHz, DIN)
Continuous RMS power output (Reference)
25 + 25 watts
(6 ohms at 1 kHz,
10% THD)
Music power output (Reference)
40 + 40 watts

Other models:
DIN power output (Rated)
20 + 20 watts
(6 ohms at 1 kHz, DIN,
240 V)
18 + 18 watts
(6 ohms at 1 kHz, DIN,
220 V)
Continuous RMS power output (Reference)
25 + 25 watts
(6 ohms at 1 kHz,
10% THD, 240 V)
23 + 23 watts
(6 ohms at 1 kHz,
10% THD, 220 V)

Inputs
TAPE IN: voltage
250 mV, impedance
47 kilohms
AUX IN: voltage
600 mV, impedance
47 kilohms
MD IN: voltage 600 mV,
impedance 47 kilohms

Outputs
TAPE OUT: voltage
250 mV, impedance
1 kilohms
MD OUT: voltage
600 mV, impedance
1 kilohms
CD OUT: Optical
PHONES (stereo phones
jack): accepts headphones
of 8 ohms or more

CD player section

System
Compact disc and digital audio system

Laser
Semiconductor laser
(λ=780 nm)
Emission duration:
continuous

Laser output
Max. 44.6 μW*
*This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with a 7 mm aperture.

Frequency response
20 Hz – 20,000 kHz

— Continued on next page —

COMPACT DISC RECEIVER

MICROFILM

SONY®

Tuner section

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range	87.5 – 108.0 MHz (50 kHz step)
Aerial	FM lead aerial
Aerial terminals	75 ohms unbalanced
Intermediate frequency	10.7 MHz

AM tuner section

Tuning range	
European model:	531 – 1,602 kHz (with the interval set at 9 kHz)
Other models:	531 – 1,602 kHz (with the interval set at 9 kHz) 530 – 1,710 kHz (with the interval set at 10 kHz)
Aerial	AM loop aerial External aerial terminals
Intermediate frequency	450 kHz

General

Power requirements	
European model:	230 V AC, 50/60 Hz
Other models:	220 – 240 V AC, 50/60 Hz
Power consumption	60 W (Normal) 3 W (power off, with clock display) 1 W (power off, without clock display)
Dimensions	190 x 91 x 315 mm
Mass	Approx. 4.4 kg

Designs and specifications are subject to change without notice.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG. WENN ABDECKUNG GEÖFFNET UND SICHEREITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLING LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVERSEL : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYAZAT! : A BURKOLAT NYITÁSAKOR LÁTHATATLAN LÉZERSUGÁRVESZÉLY! KERÜLJE A BESUGÁRZÁST!

This caution label is located inside the unit.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

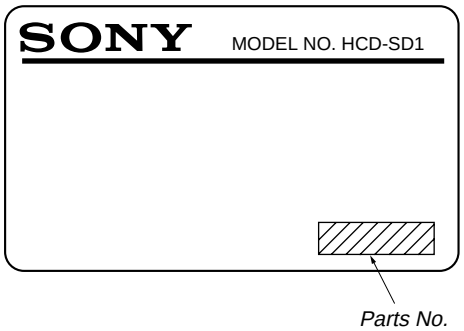
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

MODEL IDENTIFICATION
– Specification Label –



MODEL	PARTS No.
AEP, UK model	4-212-711-0☐
SP, HK model	4-212-712-0☐

- Abbreviation
  HK : Hong Kong model
  SP : Singapore model

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NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

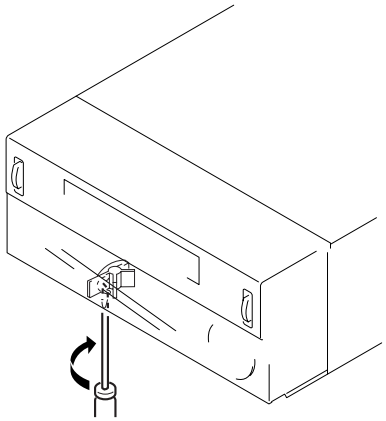
The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

LASER DIODE AND FOCUS SEARCH OPERATION CHECK

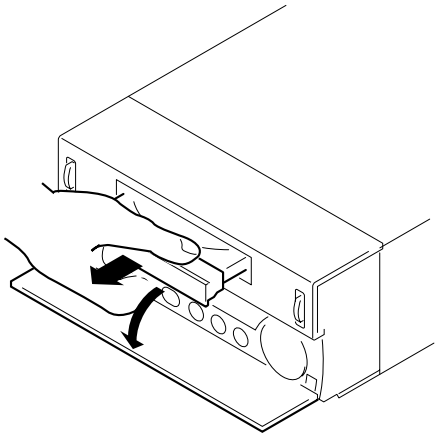
Carry out the “S curve check” in “CD section adjustment” and check that the S curve waveform is output two times.

SECTION 1
SERVICING NOTE

OPENING THE DISC TRAY WHEN POWER IS OFF



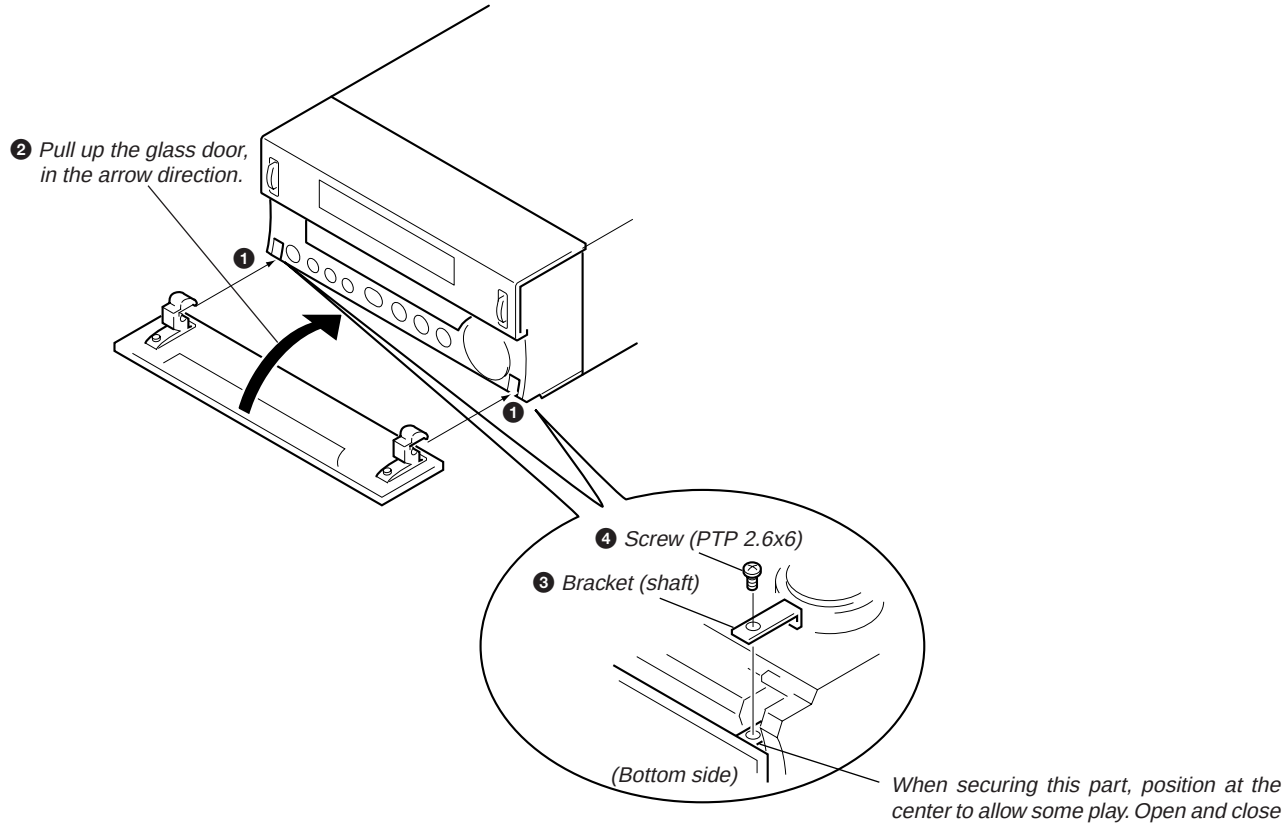
❶ *Using a thin screwdriver, rotate the internal cam in the arrow direction completely.*



❷ *Open the glass door, and pull out the loading panel.*

ATTACHING THE GLASS ASSEMBLY

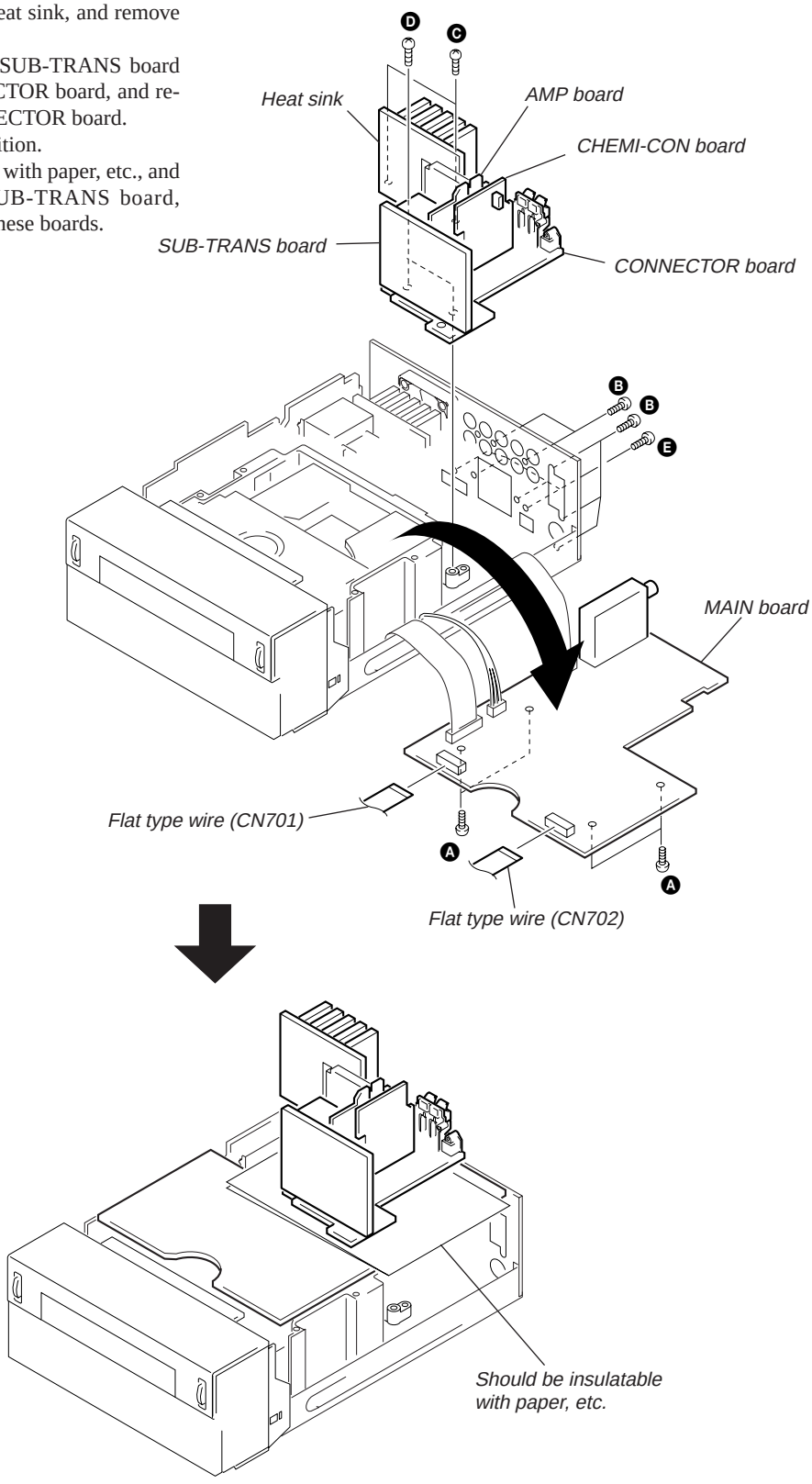
• Attach according to steps ❶ to ❹.



When securing this part, position at the center to allow some play. Open and close the glass window several times, and check that the parts do not touch each other.

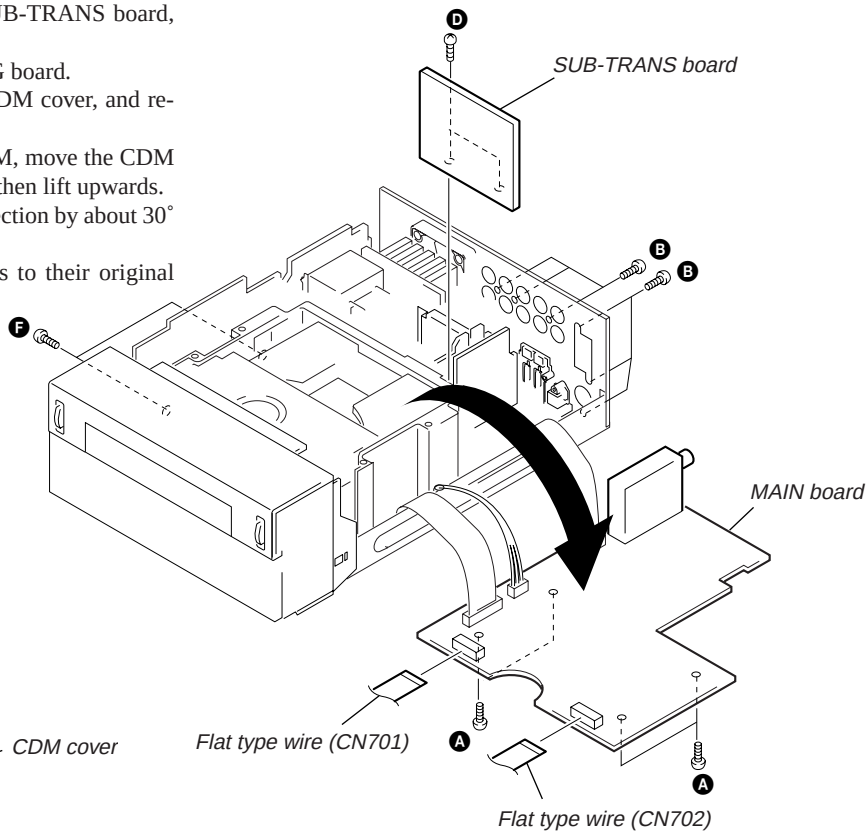
POSITIONS FOR SERVICING THE CONNECTOR BOARD, SUB-TRANS BOARD, CHEMI-CON BOARD, AND AMP BOARD

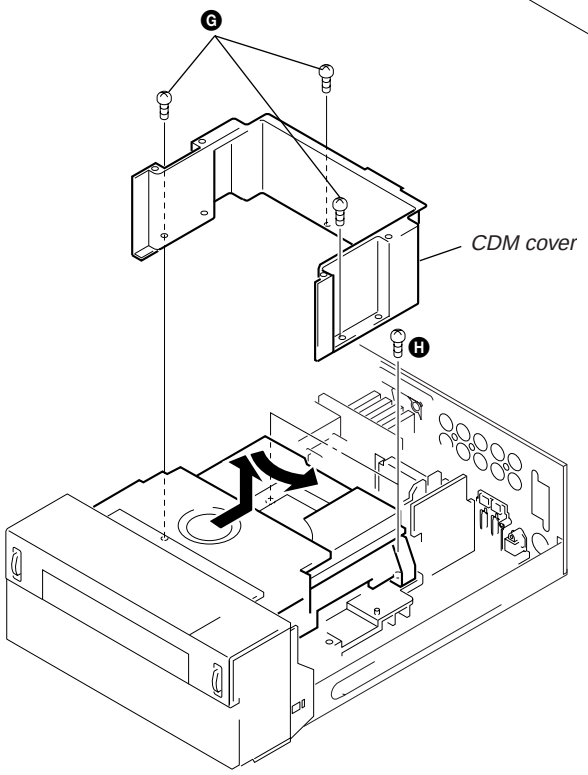
❶ Remove the four screws securing the upper cover, and remove the upper cover.
❷ Remove the loading panel. (Refer to SECTION 3 DISASSEMBLY.)
❸ Remove the four screws Ⓐ securing the MAIN board, five screws Ⓑ securing the rear panel, two flat cables (CN701, CN702), and open the MAIN board as shown in the figure.
❹ Remove the two screws Ⓒ securing the heat sink, and remove the AMP board and CHEMI-CON board.
❺ Remove the two screws Ⓓ securing the SUB-TRANS board and four screws Ⓔ securing the CONNECTOR board, and remove the SUB-TRANS board and CONNECTOR board.
❻ Return the MAIN board to its original position.
❼ Insulate these boards and the MAIN board with paper, etc., and assemble the CONNECTOR board, SUB-TRANS board, CHEMI-CON board, and AMP board on these boards.

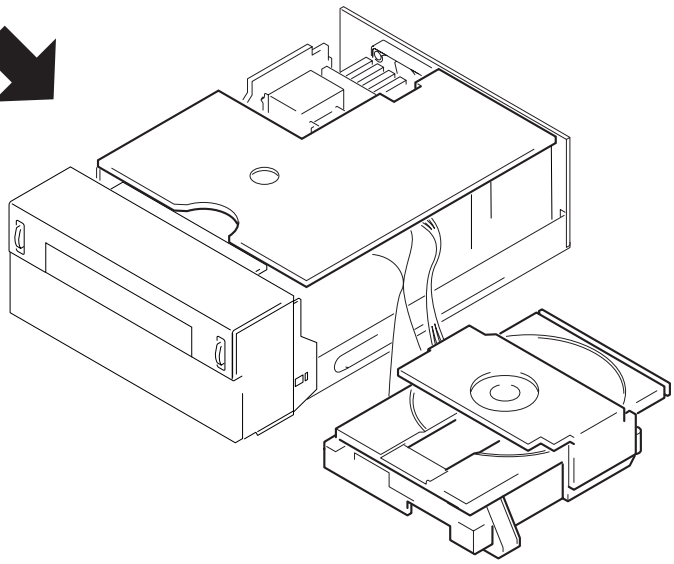


POSITION FOR SERVICING THE CD MECHANISM DECK

❶ Remove the four screws securing the upper cover, and remove the upper cover.
❷ Remove the loading panel. (Refer to SECTION 3 DISASSEMBLY.)
❸ Remove the four screws Ⓐ securing the MAIN board, five screws Ⓑ of the rear panel, and flat cables (CN701, CN702), and remove the MAIN board.
❹ Remove the two screws Ⓓ securing the SUB-TRANS board, and remove the SUB-TRANS board.
❺ Remove the two screws Ⓕ securing the REG board.
❻ Remove the three screws Ⓖ securing the CDM cover, and remove the CDM cover.
❼ Remove the two screws Ⓗ securing the CDM, move the CDM backwards by about 5 mm horizontally, and then lift upwards.
❽ Rotate the CDM in the counterclockwise direction by about 30˚ to remove.
❾ Return the MAIN and SUB-TRANS boards to their original positions.

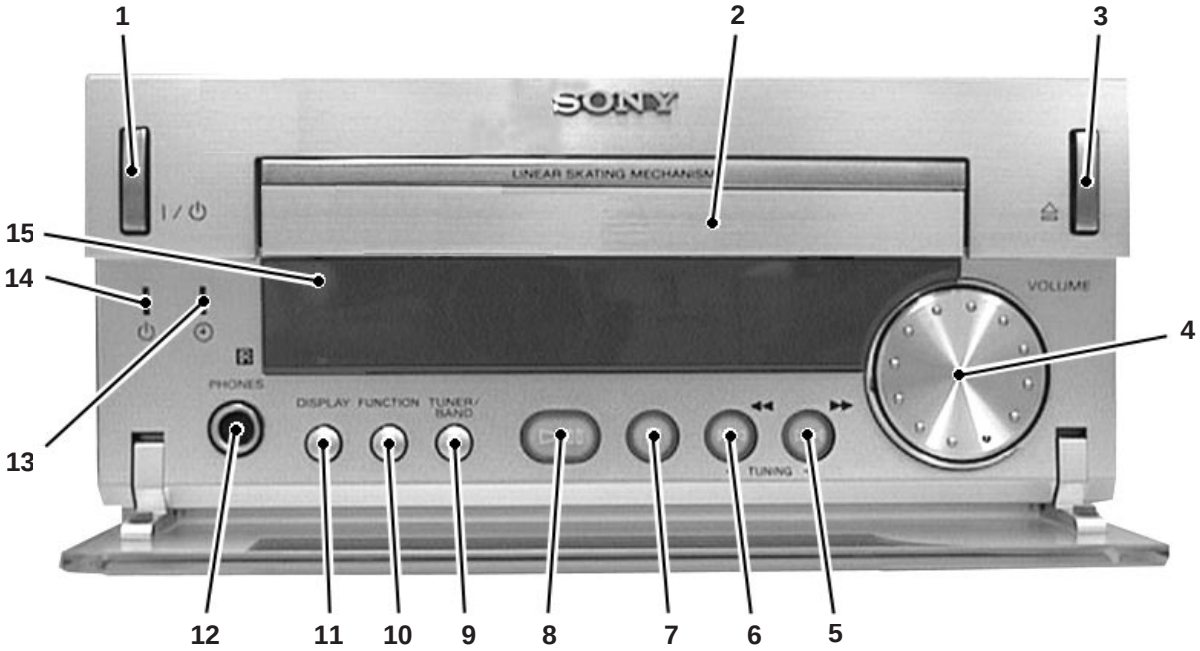






SECTION 2
GENERAL

Front Panel



Location of Parts and Controls

1 I/⏻ (Power) button
2 CD disc tray
3 ⏏ button
4 VOLUME dial
5 ▷▷Ⅱ/▶▶/TUNING + button
6 Ⅱ◁◁/◀◀/TUNING – button
7 ☐ button
8 ▷Ⅱ button
9 TUNER/BAND button
10 FUNCTION button
11 DISPLAY button
12 PHONES jack
13 🕘 indicator
14 ⏻ indicator
15 Display window

This section is extracted from instruction manual.

7

To change the time

You can change the preset time while the power is on.

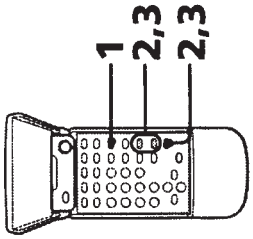
1 Press TIMER SET.
2 Press +/– repeatedly until "CLOCK SET" appears then press ENTER.
3 Repeat steps 2 and 3.

Tips

- If you have made a mistake, start again from step 1.
- The built-in clock shows the time in the display while the power is off. However, the clock is not displayed in the Power Saving Mode (see page 8).
- The upper dot flashes for the first half of a minute (0 to 29 seconds), and the lower dot flashes for the last half of a minute (30 to 59 seconds).

Step 2: Setting the time

You must set the time before you can use the timer functions.
The clock is on a 24-hour system for the European model, and a 12-hour system for other models.
The 24 hour system model is used for illustration purpose.
Set the time before turning the power on.



1 Press TIMER SET while the power is off.
The hour indication flashes.

2 Press +/– to set the hour then press ENTER.
The minute indication flashes.

3 Press +/– to set the minute then press ENTER.
The clock starts.

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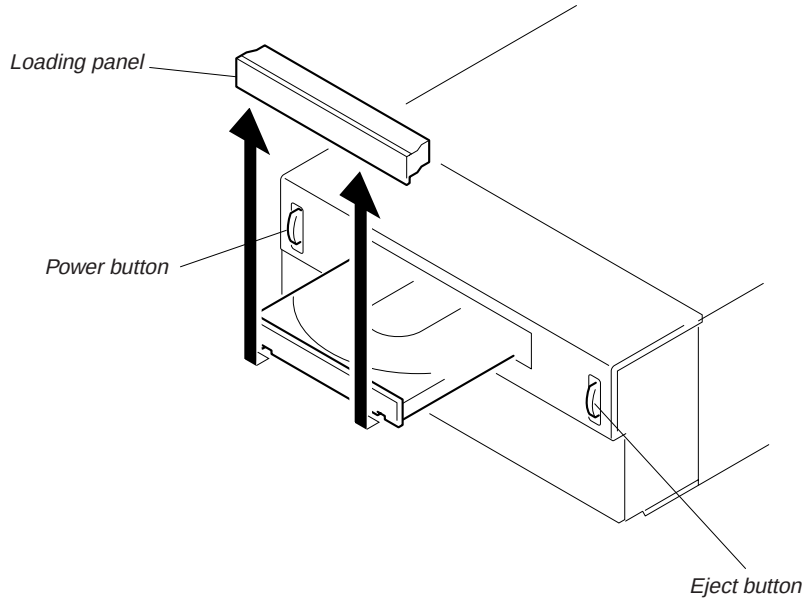
SECTION 3
DISASSEMBLY

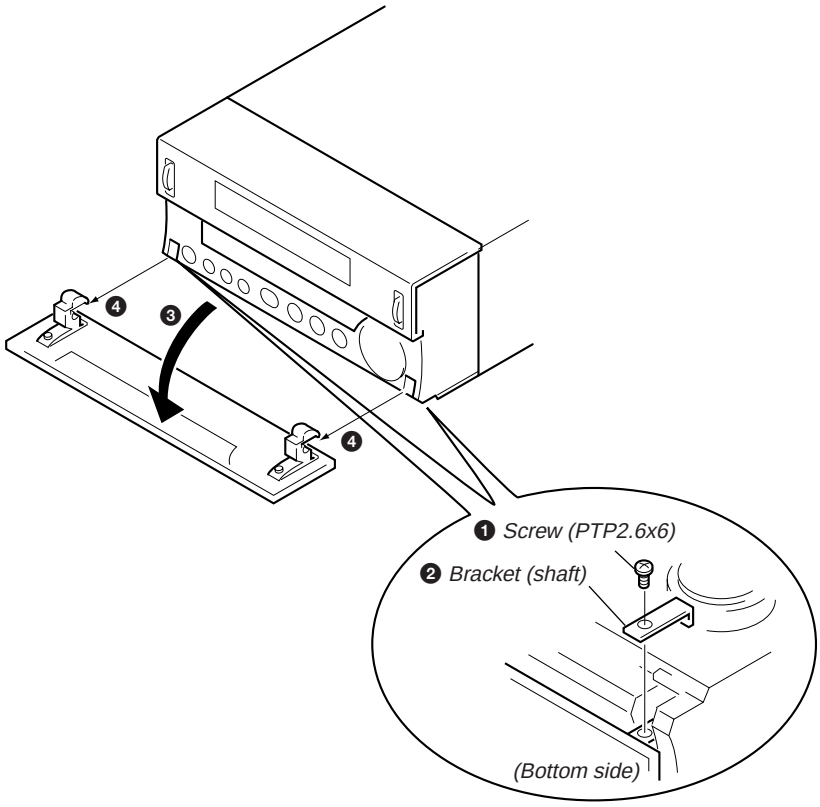
Note: Follow the disassembly procedure in the numerical order given.

3-1. LOADING PANEL

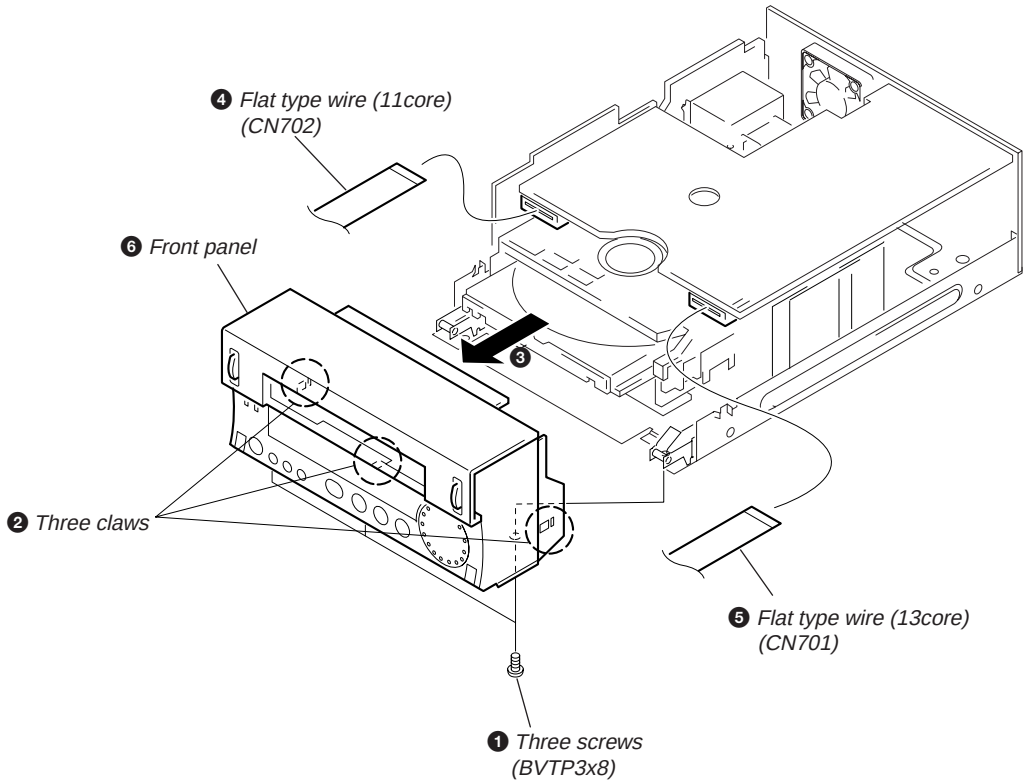
❶ Turn ON the power, and press the EJECT button to open the tray.
❷ Remove the loading panel in the arrow direction.
❸ Press the EJECT button to close the tray.
• If the power cannot be turned ON, refer to “Opening the Disc Tray When the Power is OFF” of “Service Note”, and open the tray.



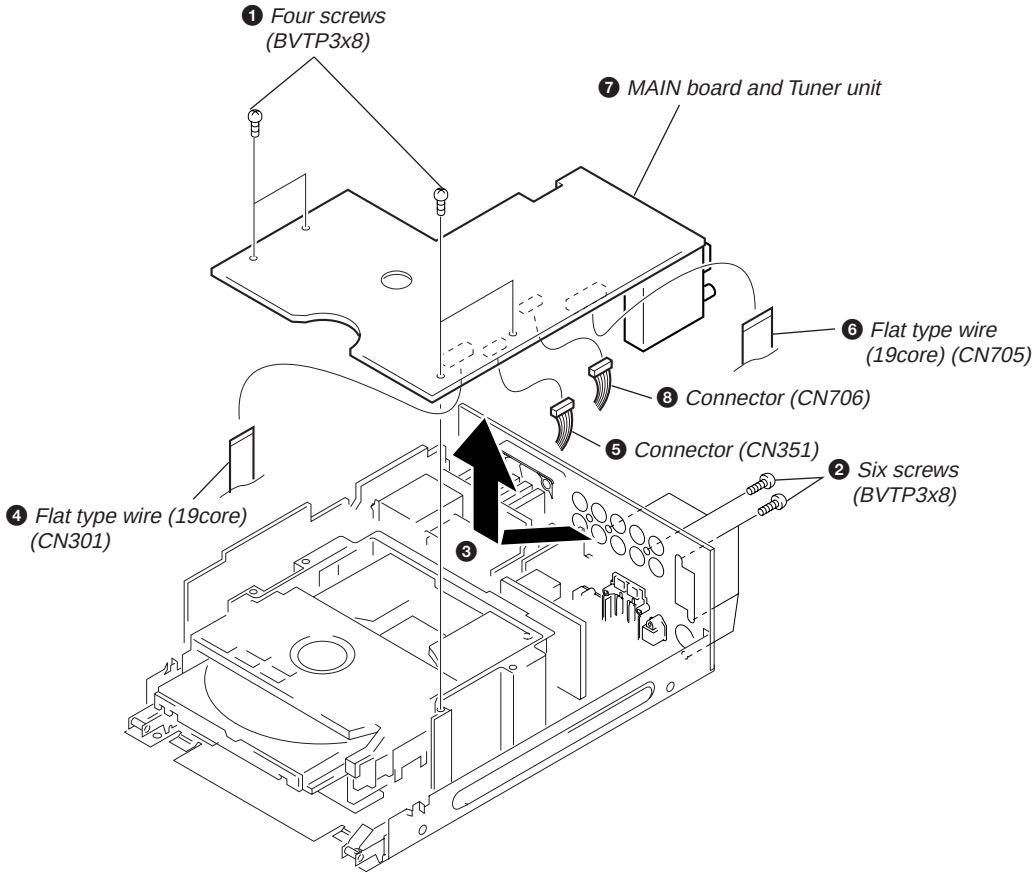
3-2. GLASS ASSY



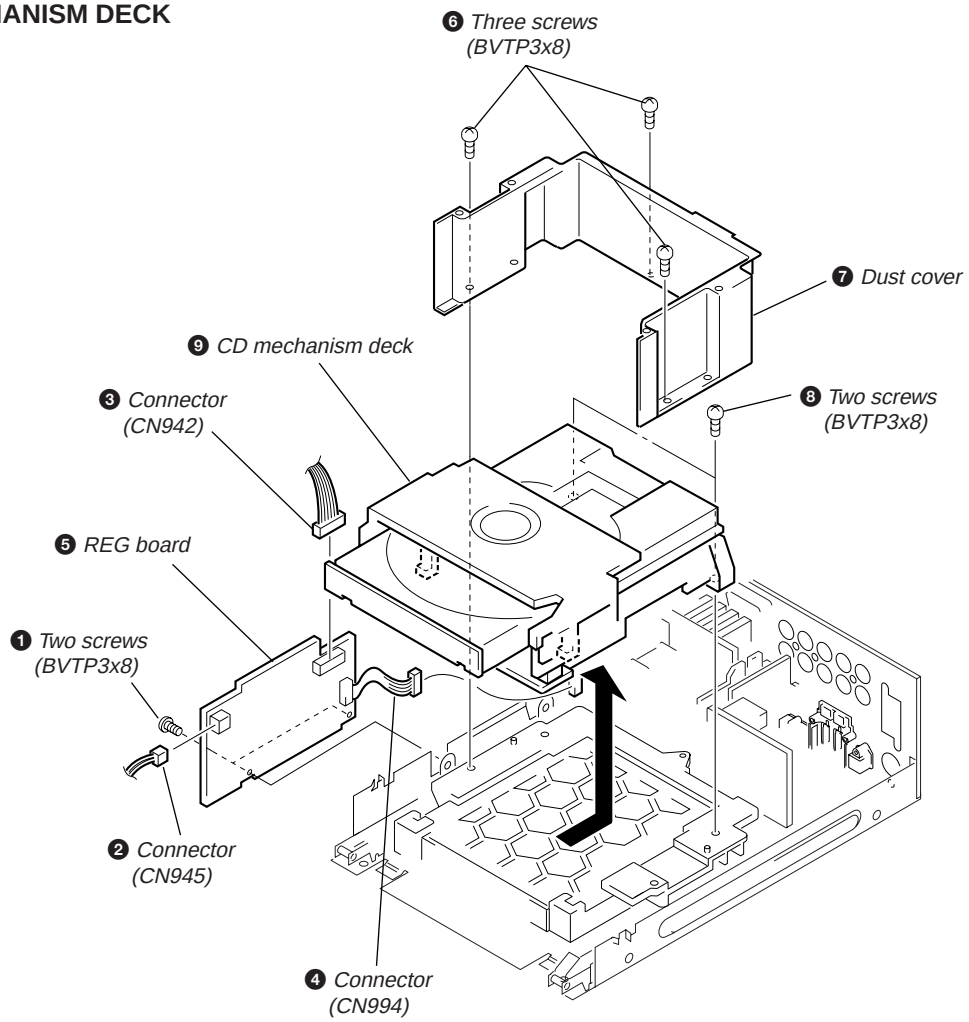
3-3. FRONT PANEL



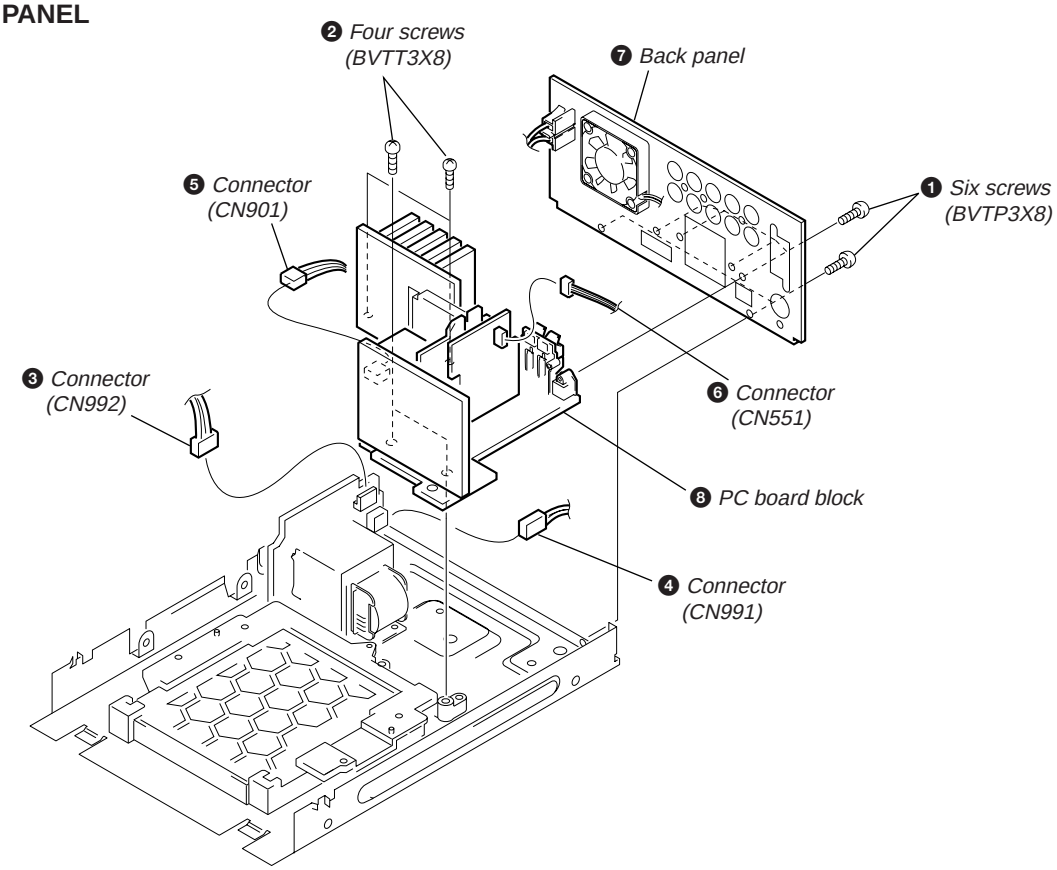
3-4. MAIN BOARD AND TUNER UNIT



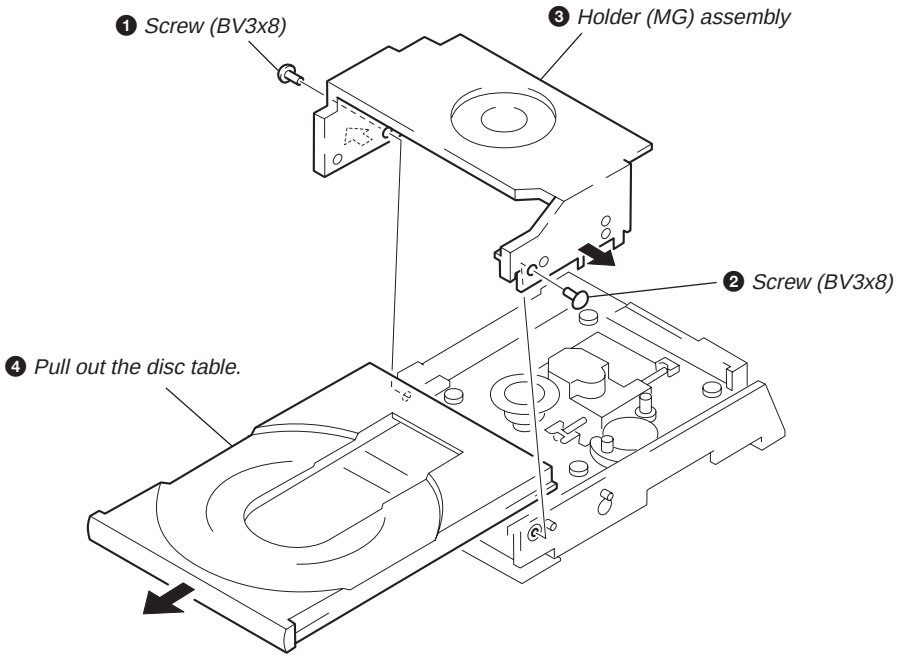
3-5. CD MECHANISM DECK



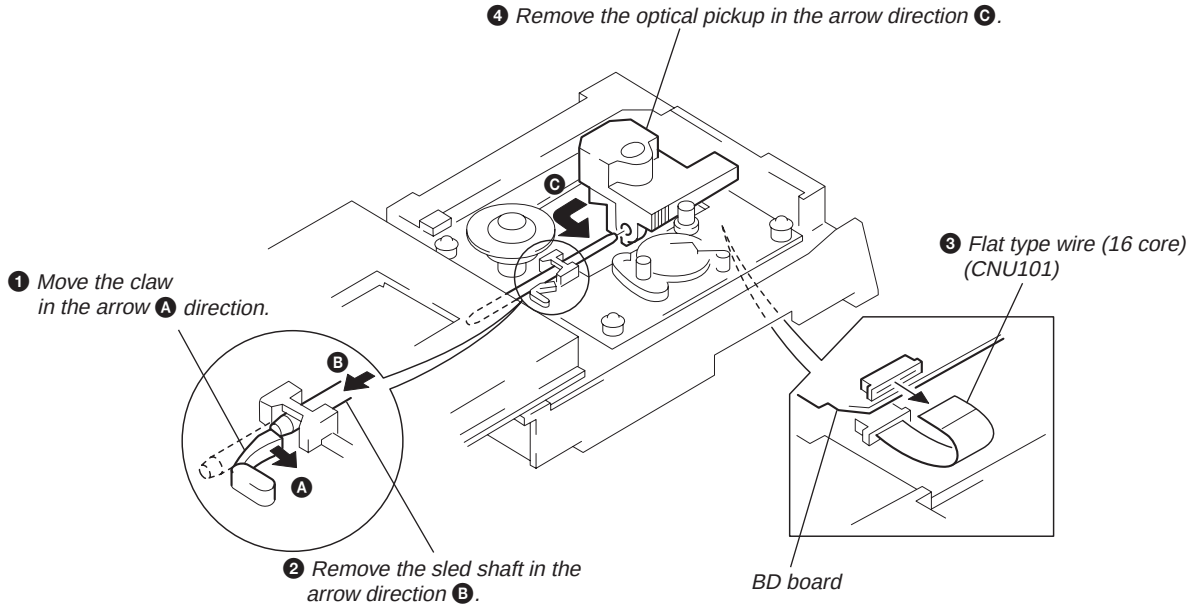
3-6. BACK PANEL



3-7. DISC TABLE



3-8. OPTICAL PICK-UP


❹ Remove the optical pickup in the arrow direction Ⓒ.
❸ Flat type wire (16 core) (CNU101)
❶ Move the claw in the arrow Ⓐ direction.
Ⓒ
Ⓑ
Ⓐ
❷ Remove the sled shaft in the arrow direction Ⓑ.
BD board

SECTION 4
SERVICE MODE

Key Check Mode for Complete Lighting of LED/Fluorescent Display Tube

• Perform this mode to analyze and check malfunctions such as display defects and when buttons do not work.

Procedure:

1. Press the I/⏻ button to turn on the power.
2. Press the DISPLAY button and ▶II button together.
3. All LEDs and the fluorescent display tube will light up completely.
4. Pressing the FUNCTION button here will light the fluorescent display tube in the following order; Partial lighting 1 → Partial lighting 2 → Complete lighting → Partial lighting 1·····
   Turning the VOLUME dial will switch the lighting order of the LED.
   To end without shifting to the key check mode, press the I/⏻ button to end.
5. Pressing the ■ button sets the key check mode.
6. During the key check mode, "KEY=0 JOG=0" will be displayed on the fluorescent display tube.
   Pressing a button will increase the value of "KEY=". However the value will not increase for buttons which have already been pressed once.
   Rotating the VOLUME knob in the clockwise direction increases the value of "JOG=" in the order of 1, 2, 3.... and rotating in the counterclockwise direction decreases in order of 10, 9, and 8.
7. To end the check mode, press all buttons (8 buttons). "KEY-OK" will be displayed.
   Then press any button, and disconnect the power cord from the outlet.

Checking the Sub-Clock

• Perform this mode to check clock operations.

Procedure:

1. Connect an oscilloscope and frequency counter between the pin (TP791) and ground of IC701 of the MAIN board.
2. Press the ⏏ and I/⏻ buttons together to display "91P = 32.768k" on the fluorescent display tube.
3. Check that the signal on the oscilloscope becomes a 32 kHz rectangular waveform and the reading of the frequency counter becomes 32.768 kHz.
4. Press the I/⏻ button to end.

Sled Servo Mode

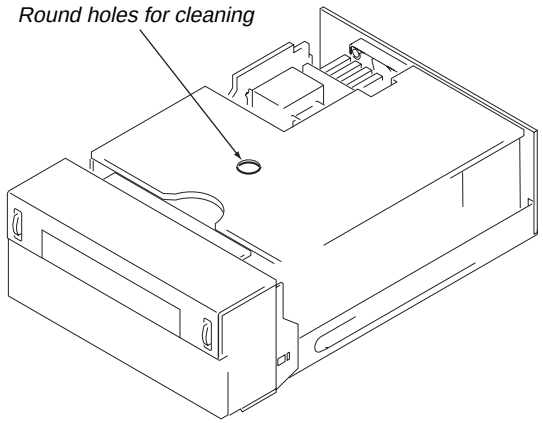
• In this mode, the CD sled motor can be operated freely.
  Execute it when cleaning the pick-up.
  Round holes can be seen on the topmost board when the case is opened. Move the pick-up and clean off the dirt in these round holes using a cotton swab.

Procedure:

1. Press the DISPLAY and ⏏ buttons with the power of the unit OFF.
2. When the sled servo is set, "MANUAL" is displayed on the fluorescent display tube.
3. Pressing the ▶▶I/TUNING/▶▶ button when the CD is in the stop state moves the pick-up to the outer track. Pressing the I◀◀/TUNING/◀◀ button moves it to the inner track.
4. To end this mode, perform the following steps.
   1) Move the If not, the disc cannot be removed.
   2) Press the DISPLAY and ⏏ buttons together.

Note:

• When ending this mode, be sure to move the pick-up to the innermost circumference. If not, the disc cannot be removed.
• Do not move the sled motor more than required as this will damage the gears.



Initializing (Forced Reset)

• Perform this mode when resetting the unit or when returning the unit to the customer.
• The preset frequency of the tuner, etc. will be the settings at shipment.

Procedure:

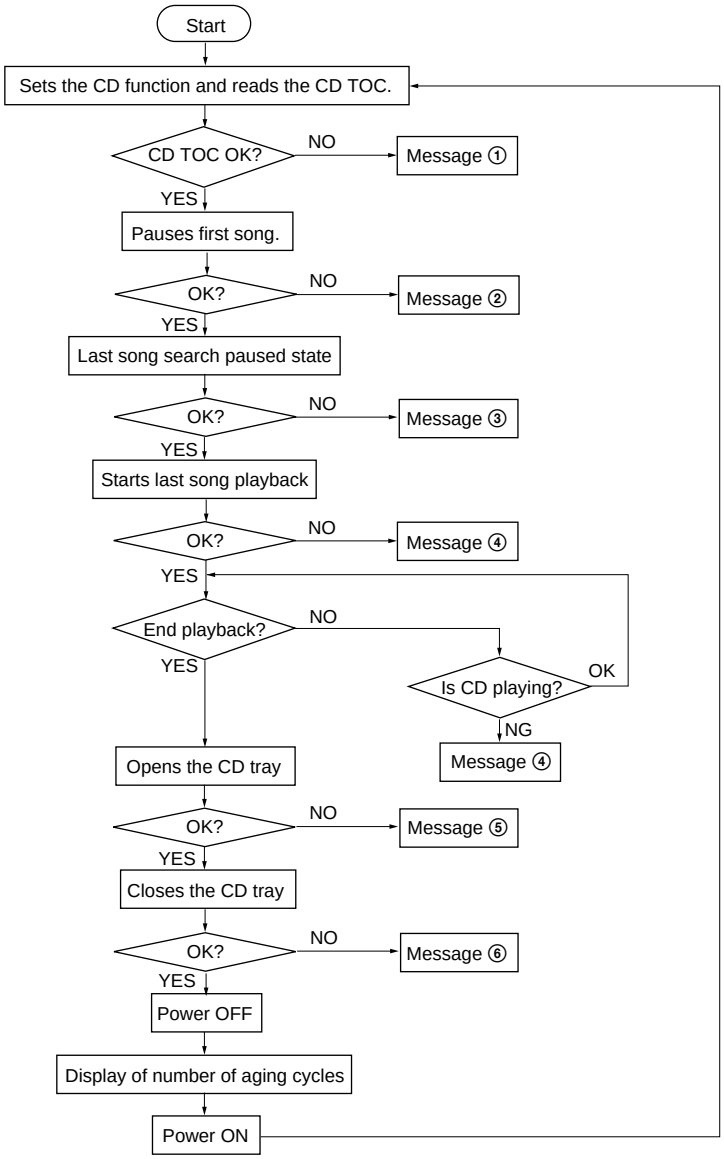
While pressing the I/⏻ button, insert the power cord into the outlet.

SECTION 5
TEST MODE

AGING MODE

This unit is equipped with an aging mode.
Use this mode for analyzing defects and for checks after completing repairs.
After repairs, perform aging 100 times and check that the unit is normal.
The aging mode is executed in the following sequence.
The aging mode will continue as long as the unit is normal.
If the unit becomes abnormal, it will display the state and number of cycles, and operations will stop. (Refer to Table 1.)

Sequence of Aging Mode:



Procedure:

1. Press the DISPLAY button and ⏮/TUNING/⏭ button together.
2. To end aging, press the ⏻ button and end.

Table-1 Messages and Main Reasons for Stop of Aging

No	Error Messages	Details of Error	Main Causes
①	CD No Disc NG	Cannot read CD TOC.	Optical defect, spindle defect (including motor), cannot read Q data, disc defect (scratches, etc.), bad focus, bad GFS, etc.
②	CD Pause NG	Cannot set CD pause in CD synchro mode.	Disc defect (scratches, etc.), cannot read Q data, etc.
③	CD Search NG	Cannot search last track on CD.	Optical defect, sled, tracking defect (including motor), cannot read Q data, disc defect (scratches, etc.).
④	CD Play NG	Cannot play last track on CD.	Optical defect, cannot read Q data, disc defect (scratches, etc.), etc.
⑤	CD Open NG	Cannot open CD tray.	LOAD OUT SW defect
⑥	CD Close NG	Cannot close CD tray.	LOAD IN SW defect

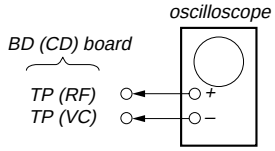
SECTION 6
ELECTRICAL ADJUSTMENTS

CD SECTION

Note:
1. CD Block is basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than 10MΩ impedance.
4. Clean the object lens by an applicator with lens cleaning liquid when the signal level is low than specified value with the following checks.
5. Adjust the focus bias adjustment when optical block is replaced.

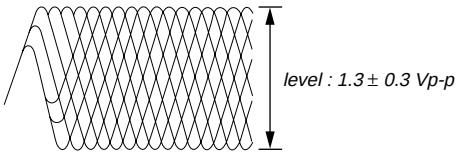
Focus Bias Adjustment

Perform this adjustment when the optical pick-up has been replaced or repaired.

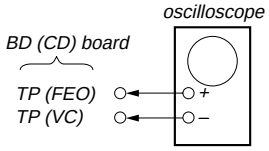


Procedure:
1. Connect oscilloscope to test point TP (RF).
2. Turned Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Adjust RV101 so that the waveform is clear.
   (Clear RF signal waveform means that the shape "◊" can be clearly distinguished at the center of the waveform.)
5. After adjustment, check the RF signal level.

• RF signal
  VOLT/DIV: 200 mV
  TIME/DIV: 500 nS

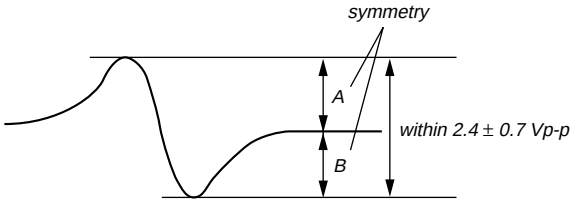


S Curve Check



Procedure :
1. Connect oscilloscope to test point TP (FEO).
2. Connect between test point TP (FOK) and Ground by lead wire.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 2.4 ± 0.7 Vp-p.

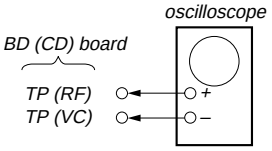
S-curve waveform



6. After check, remove the lead wire connected in step 2.

Note: • Try to measure several times to make sure than the ratio of A : B or B : A is more than 10 : 7.
• Take sweep time as long as possible and light up the brightness to obtain best waveform.

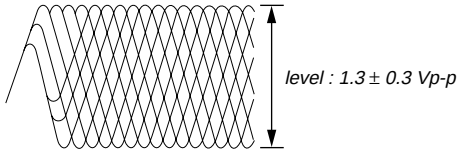
RF Level Check



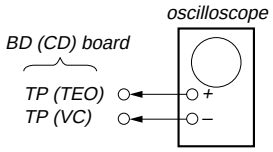
Procedure :
1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turned Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note: Clear RF signal waveform means that the shape "◊" can be clearly distinguished at the center of the waveform.

• RF signal
  VOLT/DIV: 200 mV
  TIME/DIV: 500 nS



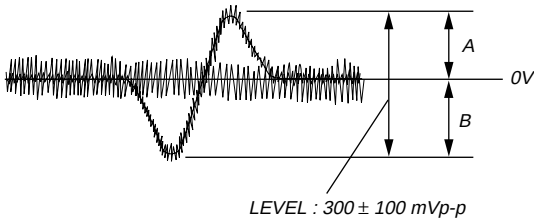
E-F Balance (1 Track Jump) Check
(Without remote commander)



Procedure :

1. Connect oscilloscpe to test point TP (TEO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in to play the number five track.
4. Press the "❚❚ (Pause)" button. (Becomes the 1 track jump mode)
5. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0Vdc, and check this level.

1 track jump waveform



Specified level: • $\frac{A - B}{2 (A + B)}$ x 100 = less than ± 7%

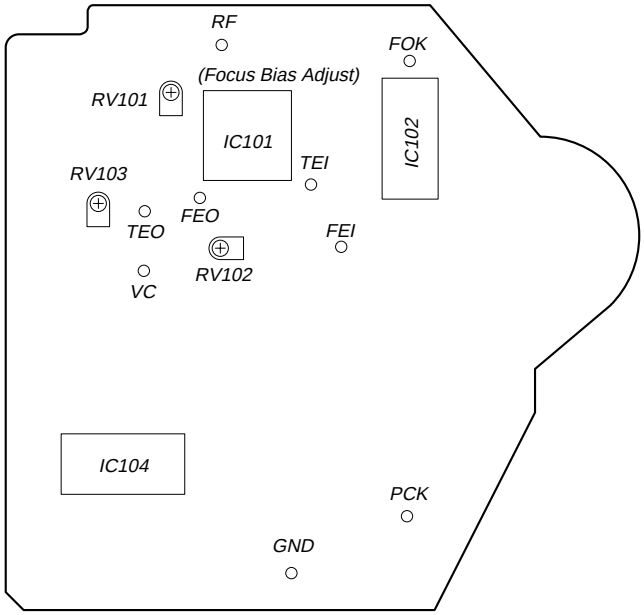
• A + B = 300 ± 100 mVp-p

Focus/Tracking Gain Adjustment (RV102, RV103)

This gain has a margin, so even if it is slightly off.
There is no problem.
Therfore, do not perform this adjustment.
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

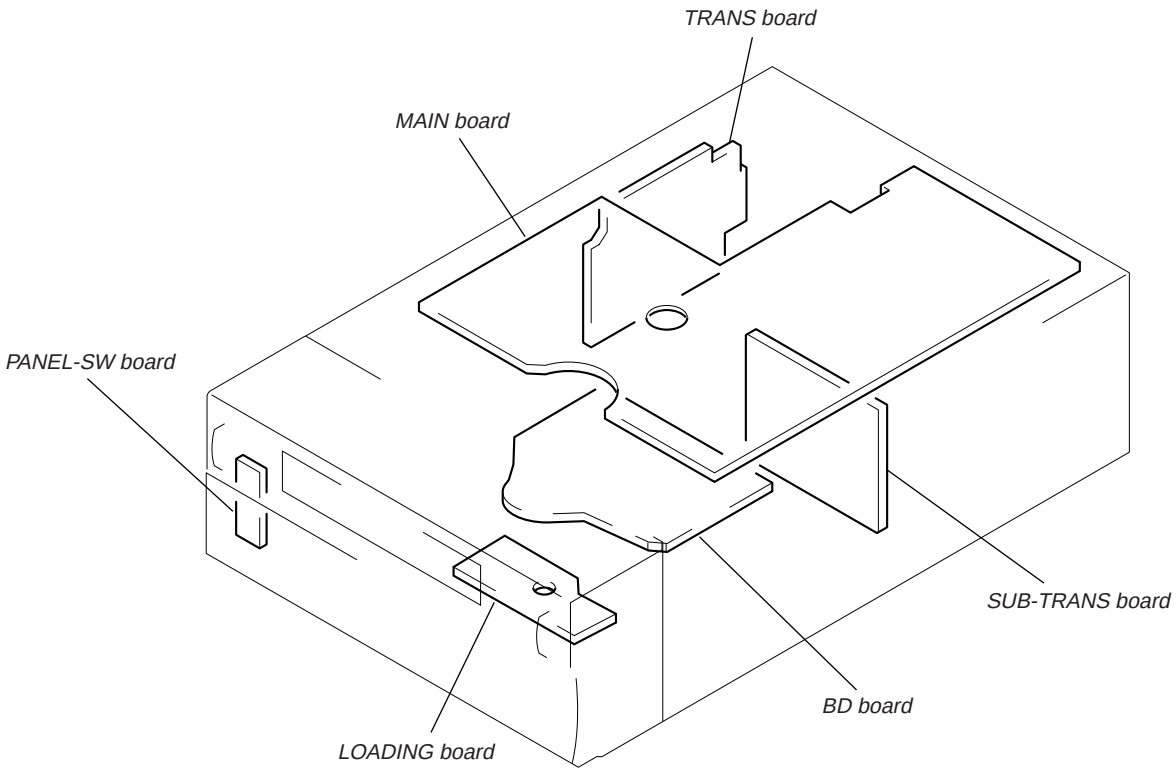
Adjustment Location:

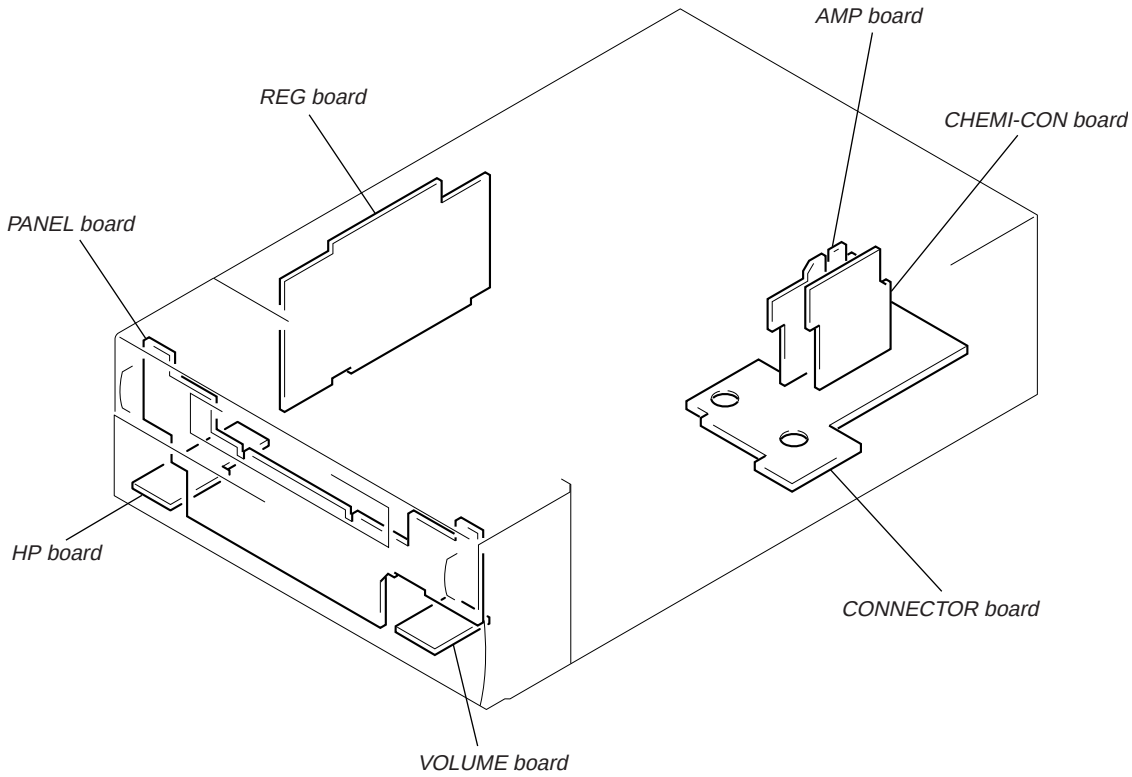
[BD (CD) BOARD] — Component Side —



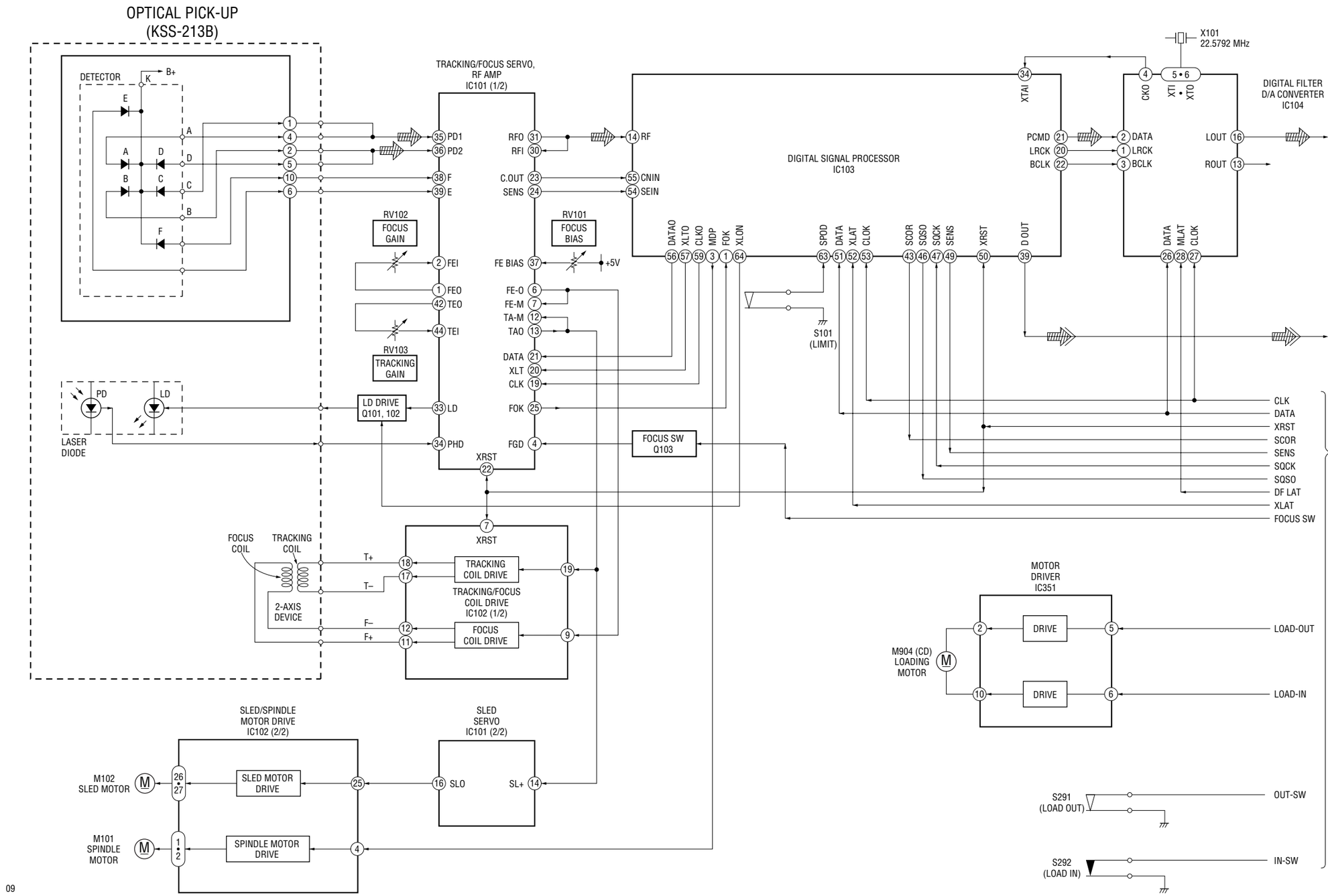
SECTION 7
DIAGRAMS

7-1. CIRCUIT BOARDS LOCATION



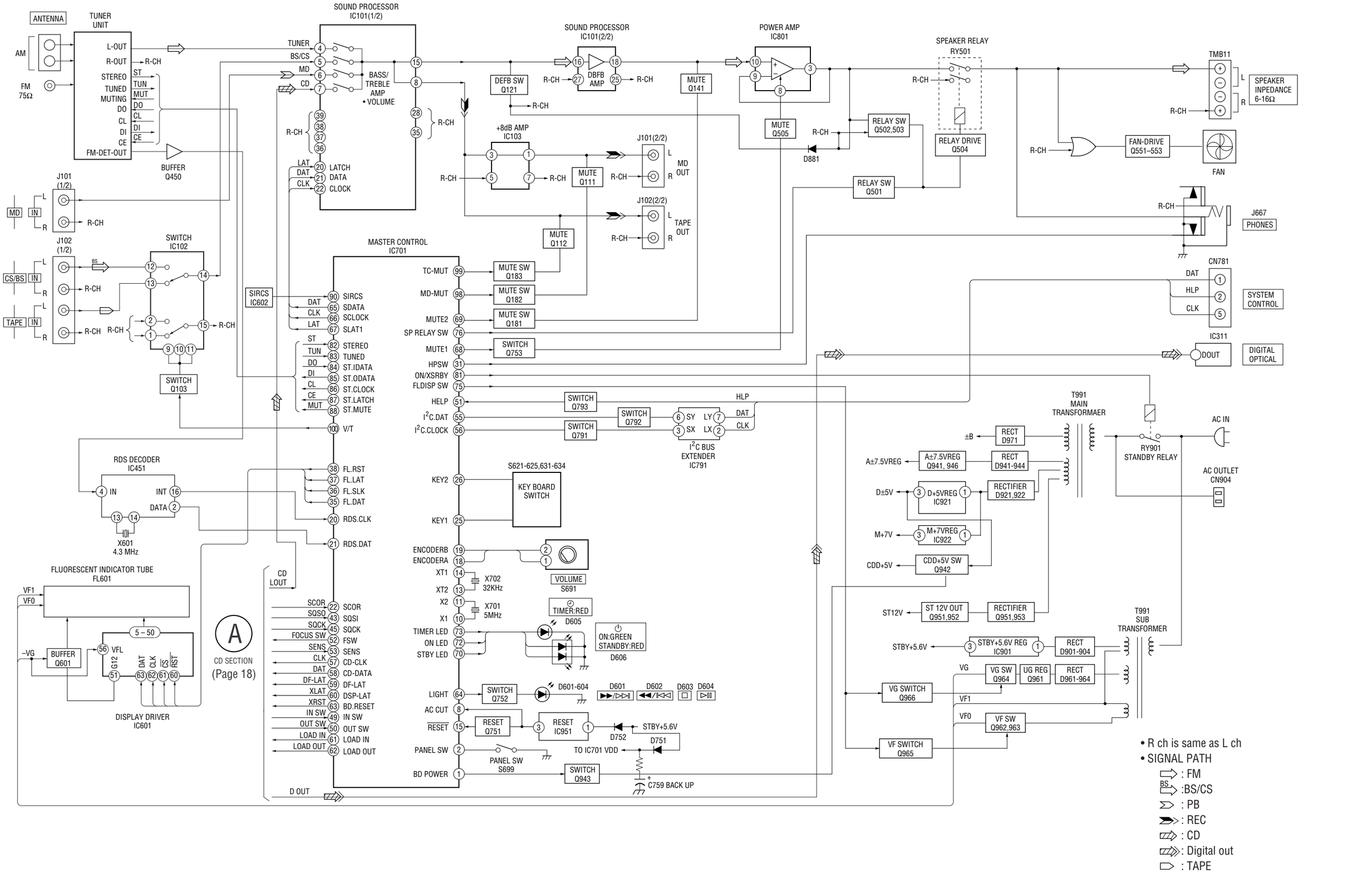


7-2. BLOCK DIAGRAMS
– BD SECTION –



• SIGNAL PATH
: CD
: Digital out

– MAIN SECTION –



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.

Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- 2 : nonflammable resistor.
- 1 : fusible resistor.
- C : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- S : B+ Line.
- T : B– Line.
- H : adjustment for repair.
- Voltages and waveforms are dc with respect to ground in service mode.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

Signal path.

F : FM
E : PB (MD)
m : PB (TAPE)
n : REC
J : CD
c : digital out

- Abbreviation
  SP : Singapore model.
  HK : Hong Kong model.

For printed wiring boards.

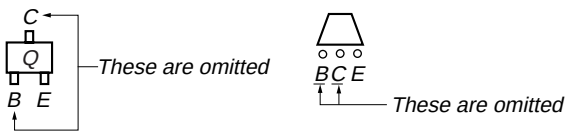
Note:

- X : parts extracted from the component side
- ■ : parts mounted on the conductor side.
- ○ : Through hole.
- △ : internal component.
- b : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

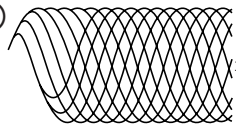
Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

- **Indication of transistor**



WAVEFORMS

– BD SECTION –

① 

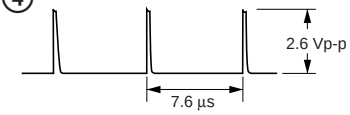
IC101 ㉛ (RFO) (PLAY Mode)
500 mV/DIV, 500 ns/DIV

②

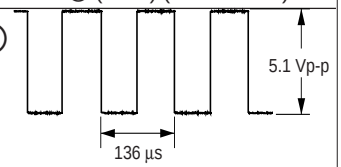
IC101 ㊹ (TEI) (PLAY Mode)
50 mV/DIV, 1 µs/DIV

③

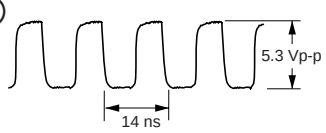
IC101 ② (FEI) (PLAY Mode)
50 mV/DIV, 1 µs/DIV

④ 

IC103 ③ (MDP) (PLAY Mode)

⑤ 

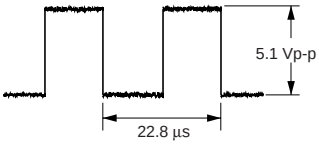
IC103 ㉘ (RFCK)

⑥ 

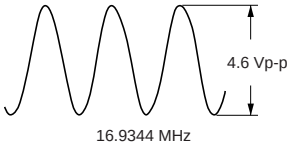
IC103 ㉕ (XPCK)

⑦

IC103 ㉒ (BCLK)

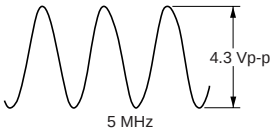
⑧ 

IC103 ⑳ (LRCK)

⑨ 

IC104 ⑥ (XTO)

– MAIN SECTION –

① 

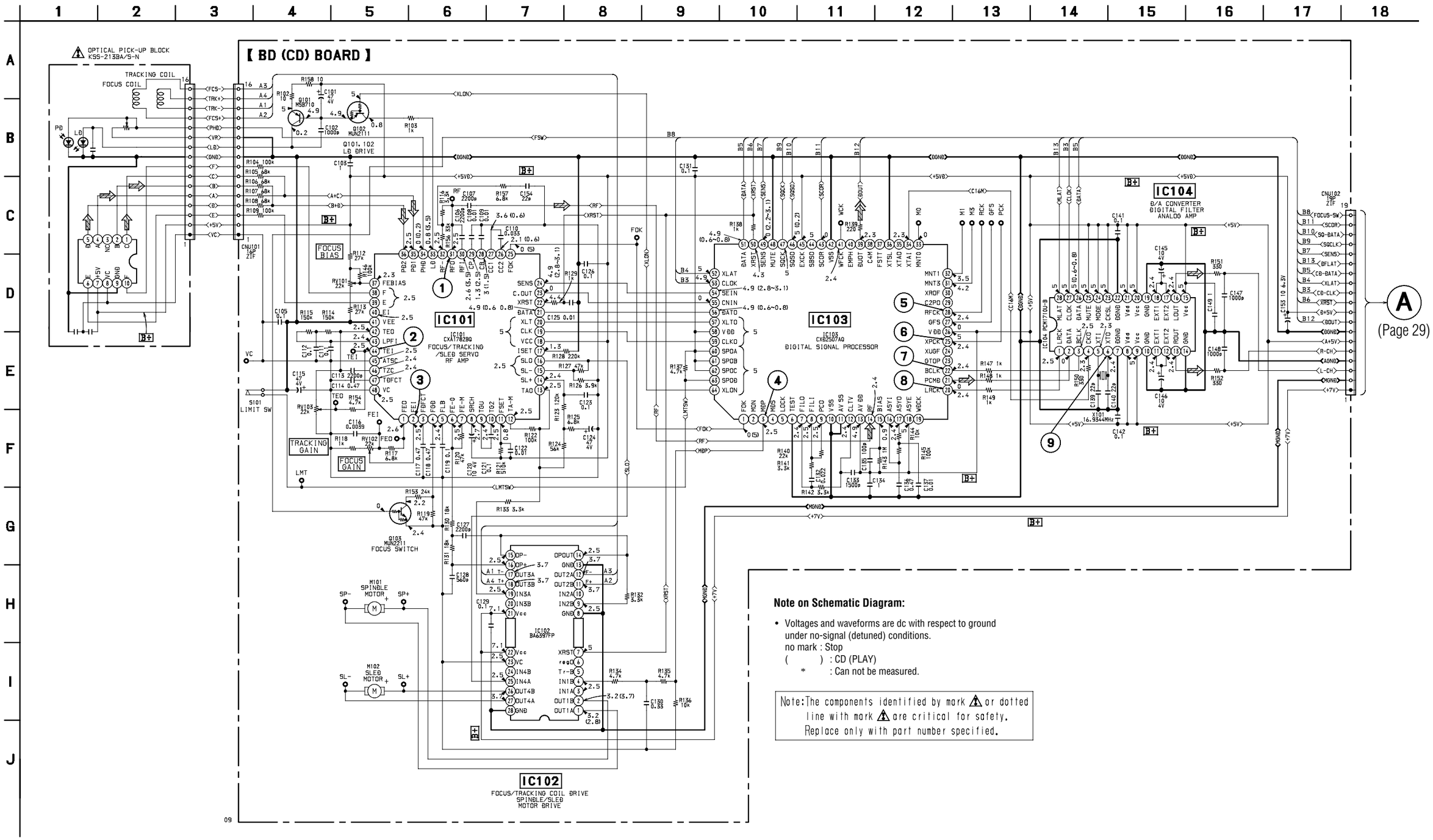
IC701 ⑪ (XI)

②

IC701 ⑭ (XI)

7-3. SCHEMATIC DIAGRAM – BD SECTION –

- See page 22 for Waveforms.
- See page 51 for IC Block Diagrams.



Note on Schematic Diagram:

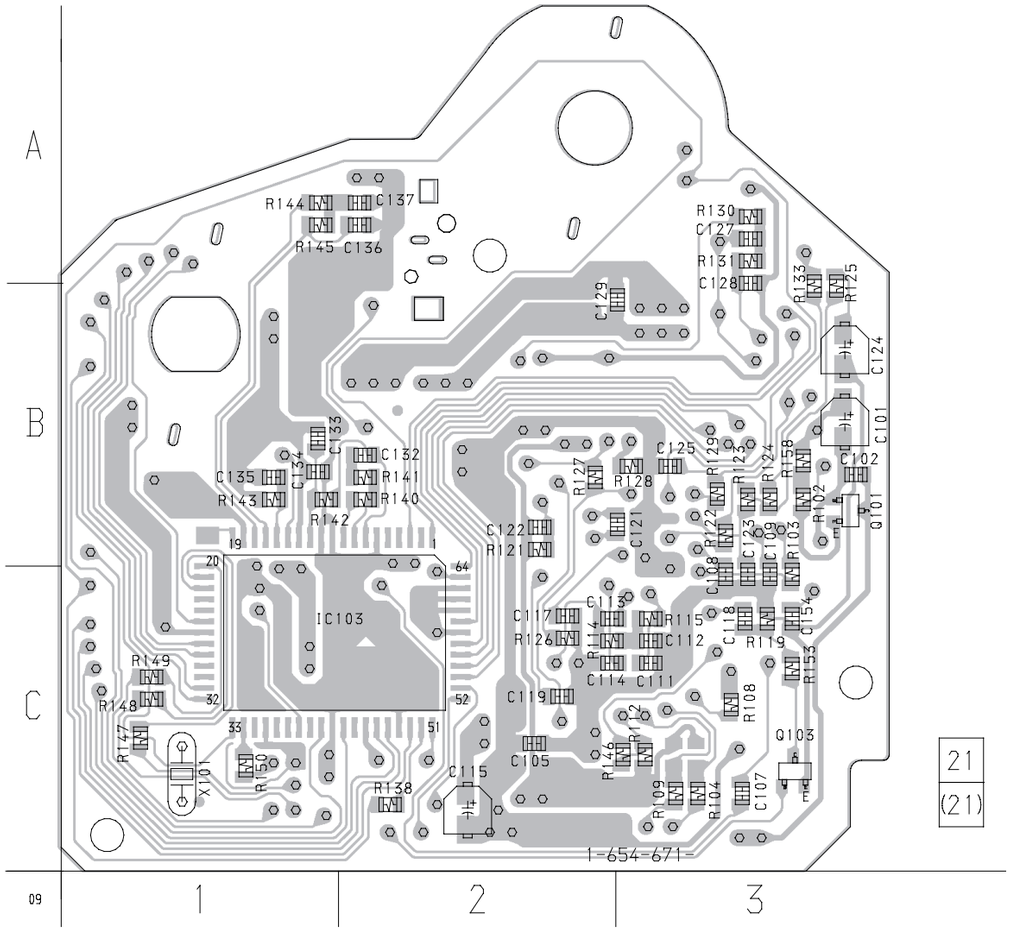
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : Stop
  ( ) : CD (PLAY)
  * : Can not be measured.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

7-4. PRINTED WIRING BOARD – BD SECTION –

• See page 16 for Circuit Boards Location.

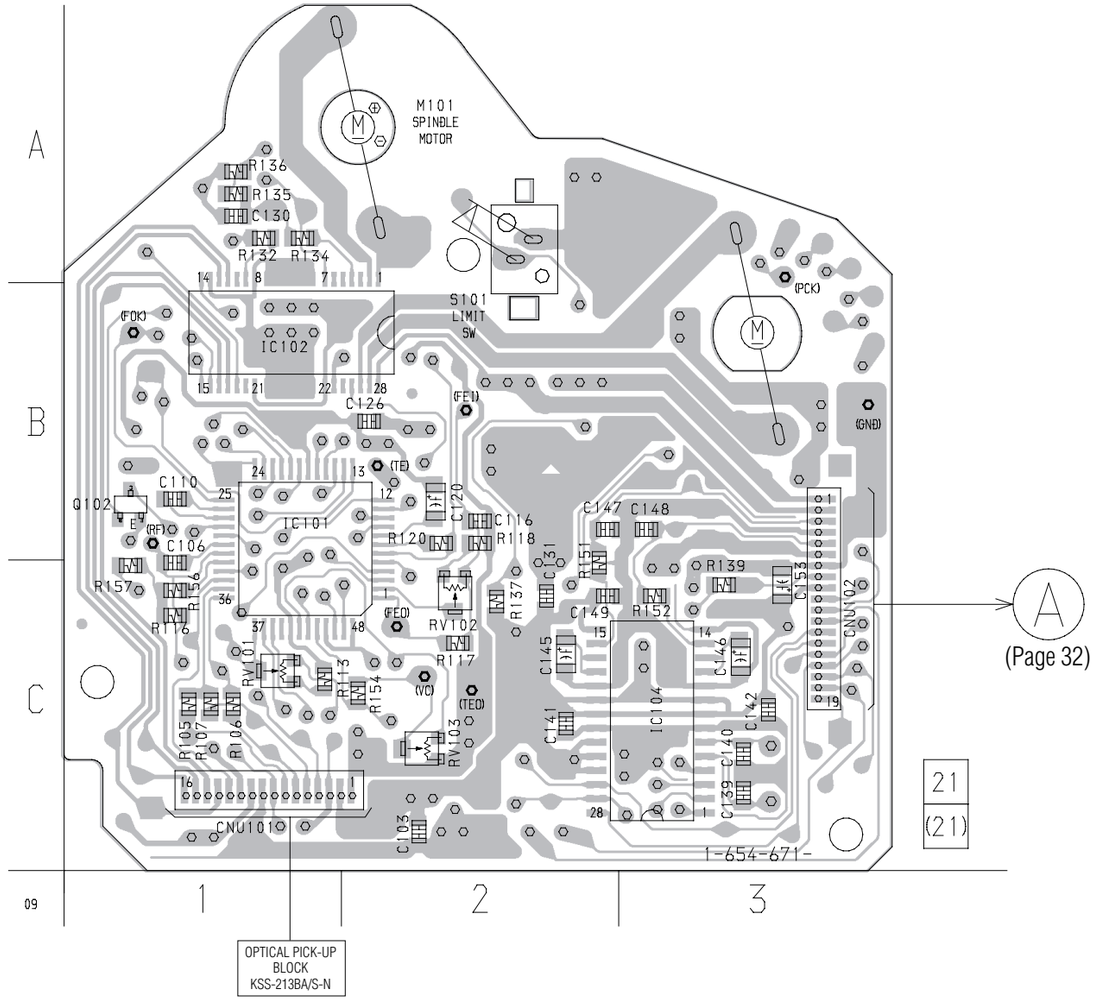
【BD (CD) BOARD】 (SIDE A)



• **Semiconductor Location**

Ref. No.	Location
IC103	C-1
Q101	B-3
Q103	C-3

【BD (CD) BOARD】 (SIDE B)

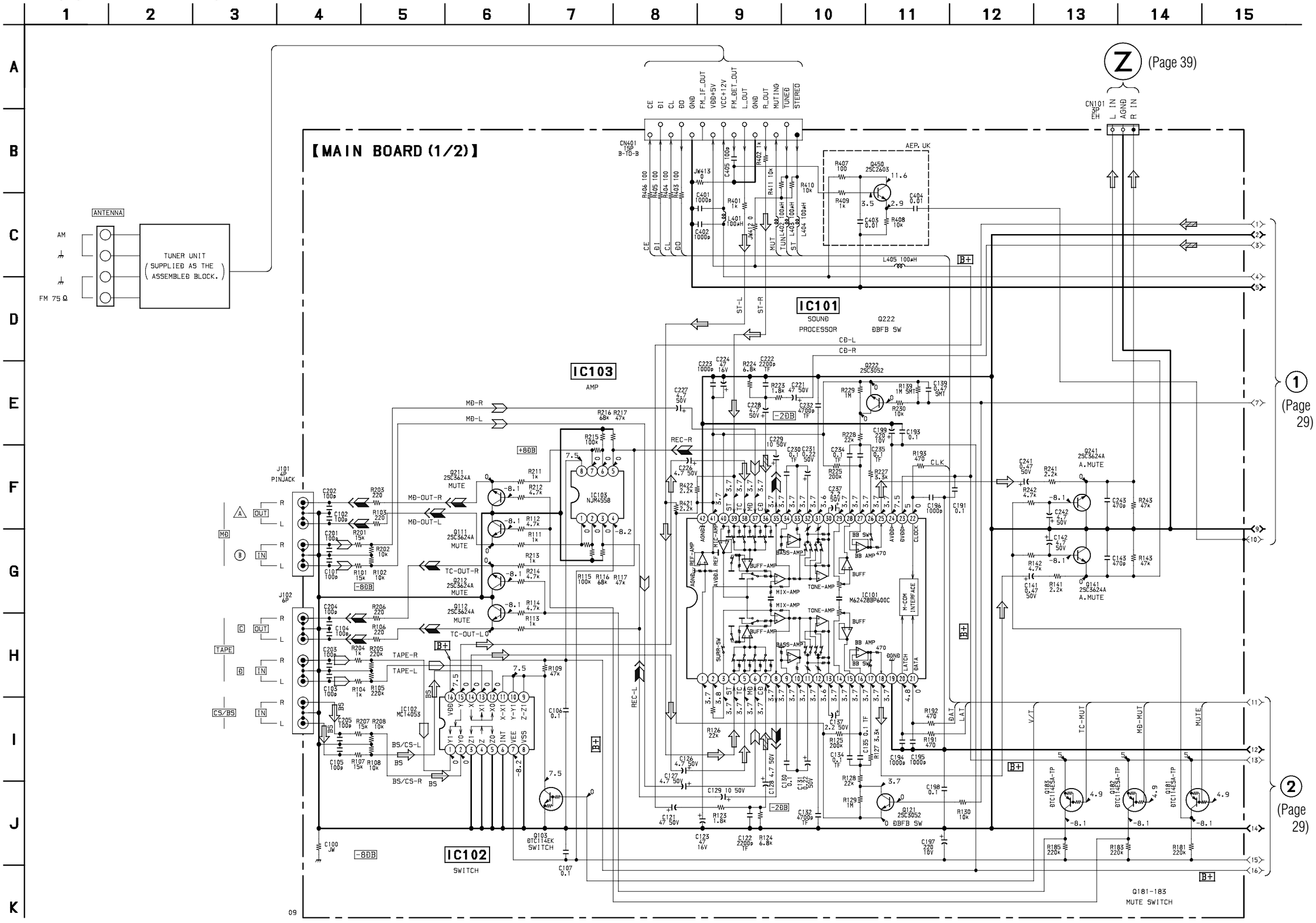


• **Semiconductor Location**

Ref. No.	Location
IC101	B-1
IC102	B-1
IC104	C-3
Q102	B-1

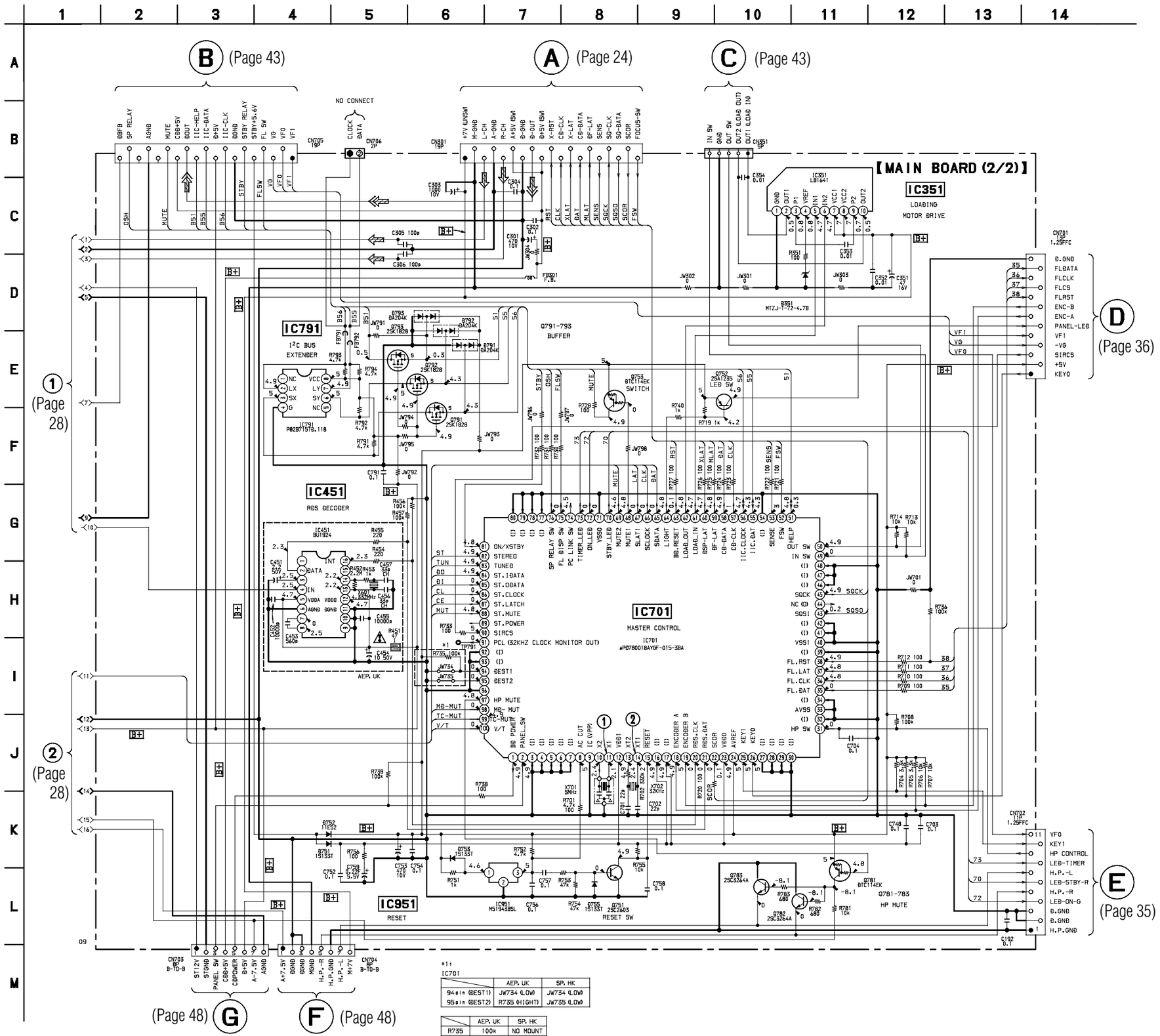
7-5. SCHEMATIC DIAGRAM – MAIN (1/2) SECTION –

- See page 22 for Waveforms.
- See page 31 for Printed Wiring Board.



7-6. SCHEMATIC DIAGRAM – MAIN (2/2) SECTION –

- See page 22 for Waveforms.
- See page 31 for Printed Wiring Board.
- See page 53 for IC Block Diagrams.
- See page 54 for IC Pin Functions.



*1:
IC701

	AEP, UK	SP, HK
94pin (BEST1)	JW734 (LOW)	JW734 (LOW)
95pin (BEST2)	R735 (HIGHT)	JW735 (LOW)

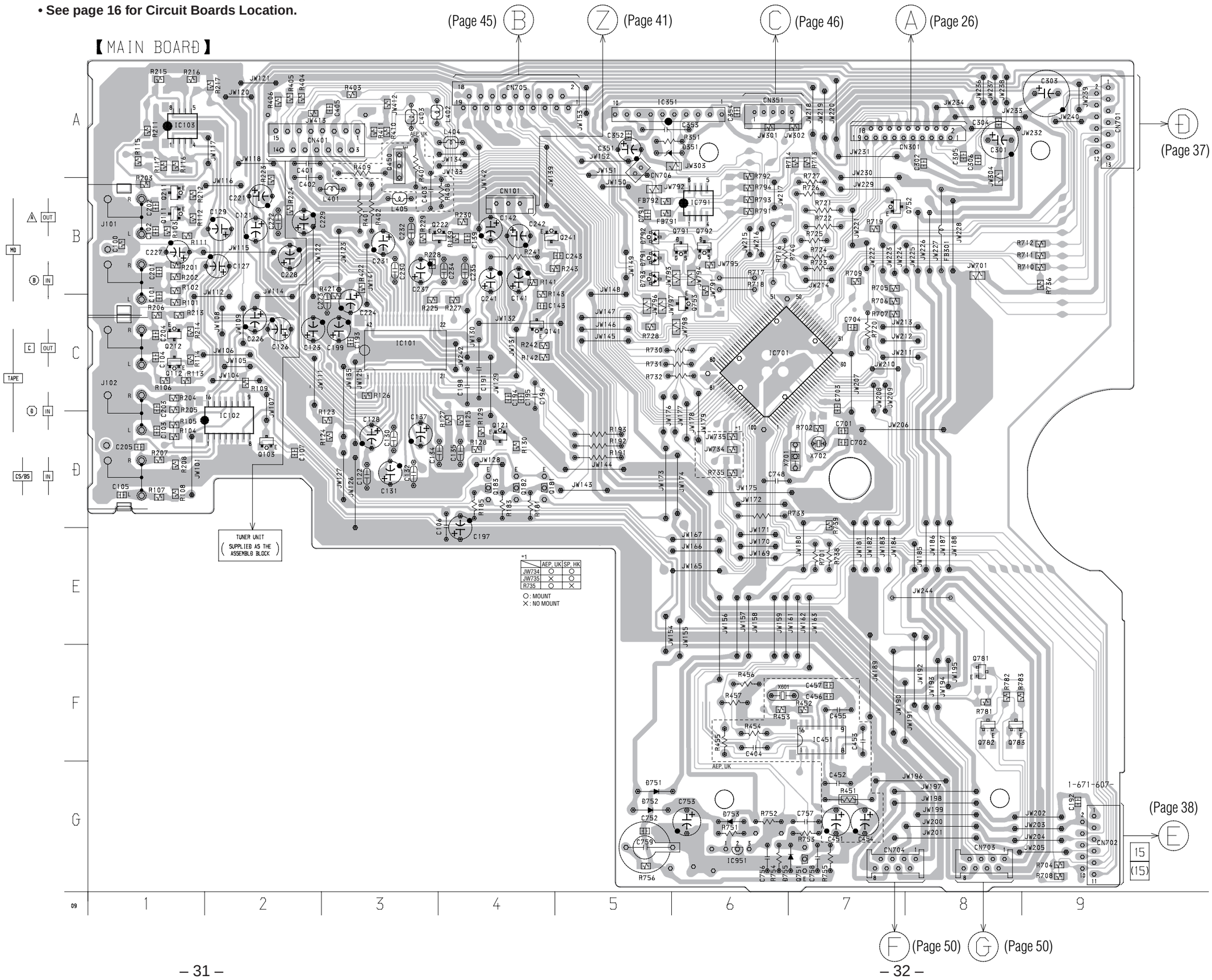
	AEP, UK	SP, HK
R735	100k	NO MOUNT
JW734	0	0
JW735	NO MOUNT	0

7-7. PRINTED WIRING BOARD – MAIN SECTION –

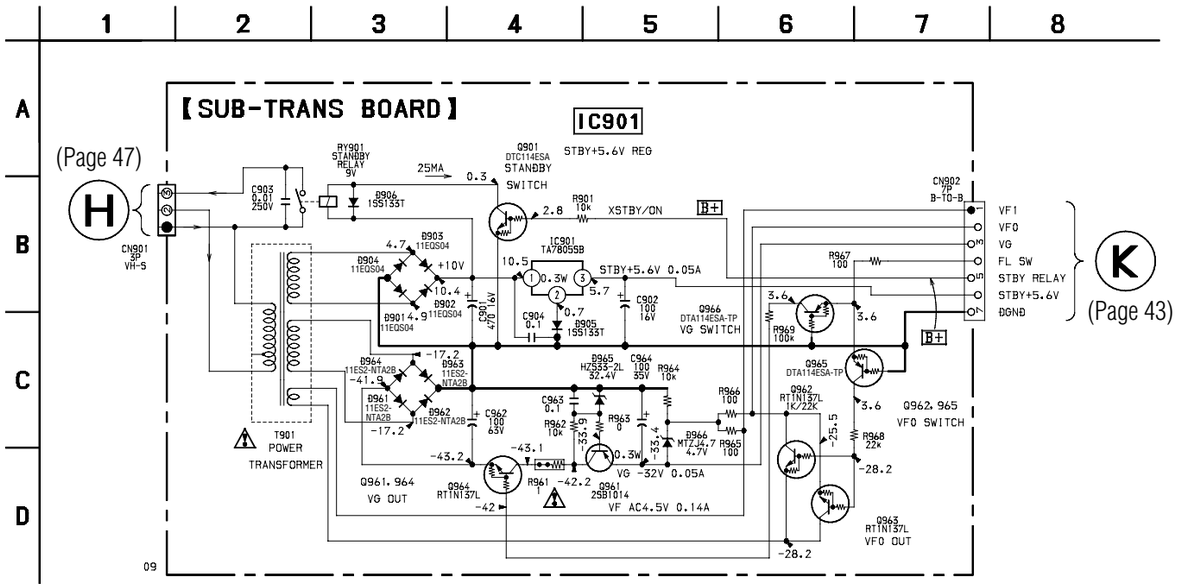
• See page 16 for Circuit Boards Location.

• **Semiconductor Location**

Ref. No.	Location
D351	A-6
D751	G-5
D752	G-5
D753	G-6
D755	G-6
D791	B-5
D792	B-5
D793	B-5
IC101	C-3
IC102	D-2
IC103	A-1
IC351	A-5
IC701	C-6
IC791	B-6
IC951	G-6
Q103	D-2
Q111	B-1
Q112	C-1
Q121	D-4
Q141	C-4
Q181	D-4
Q182	D-4
Q183	D-4
Q211	B-1
Q212	C-1
Q222	B-3
Q241	B-4
Q751	G-7
Q752	B-7
Q753	C-6
Q781	F-8
Q782	F-8
Q783	F-8
Q791	B-6
Q792	B-6
Q793	C-6

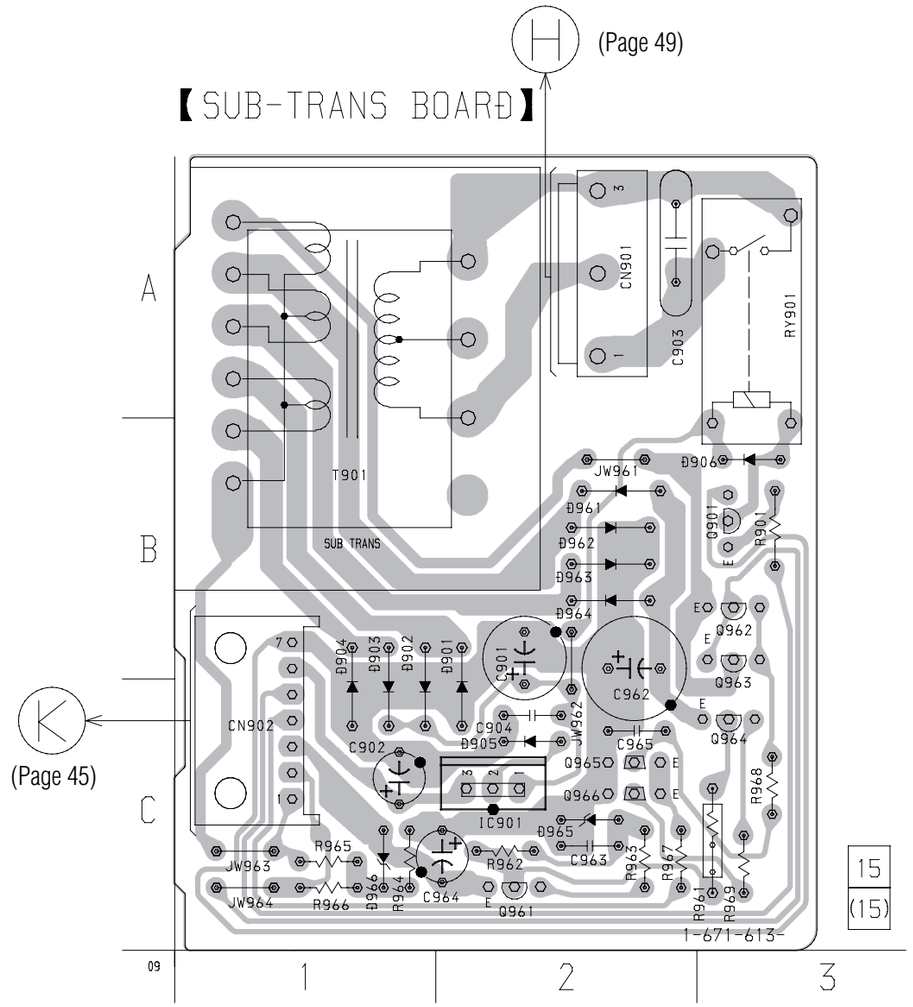


7-8. SCHEMATIC DIAGRAM – SUB SECTION –



7-9. PRINTED WIRING BOARD – SUB SECTION –

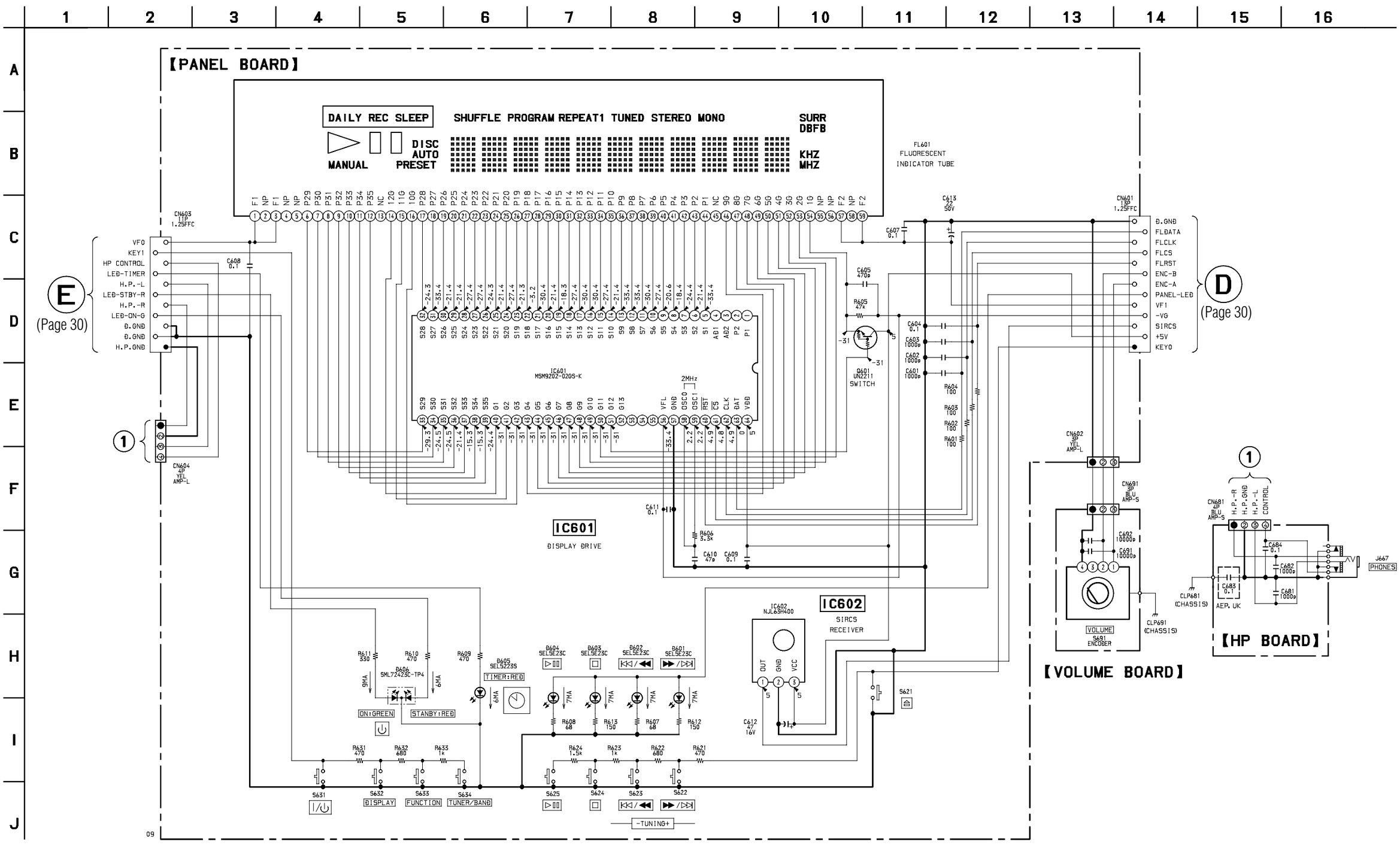
• See page 16 for Circuit Boards Location.



• Semiconductor Location

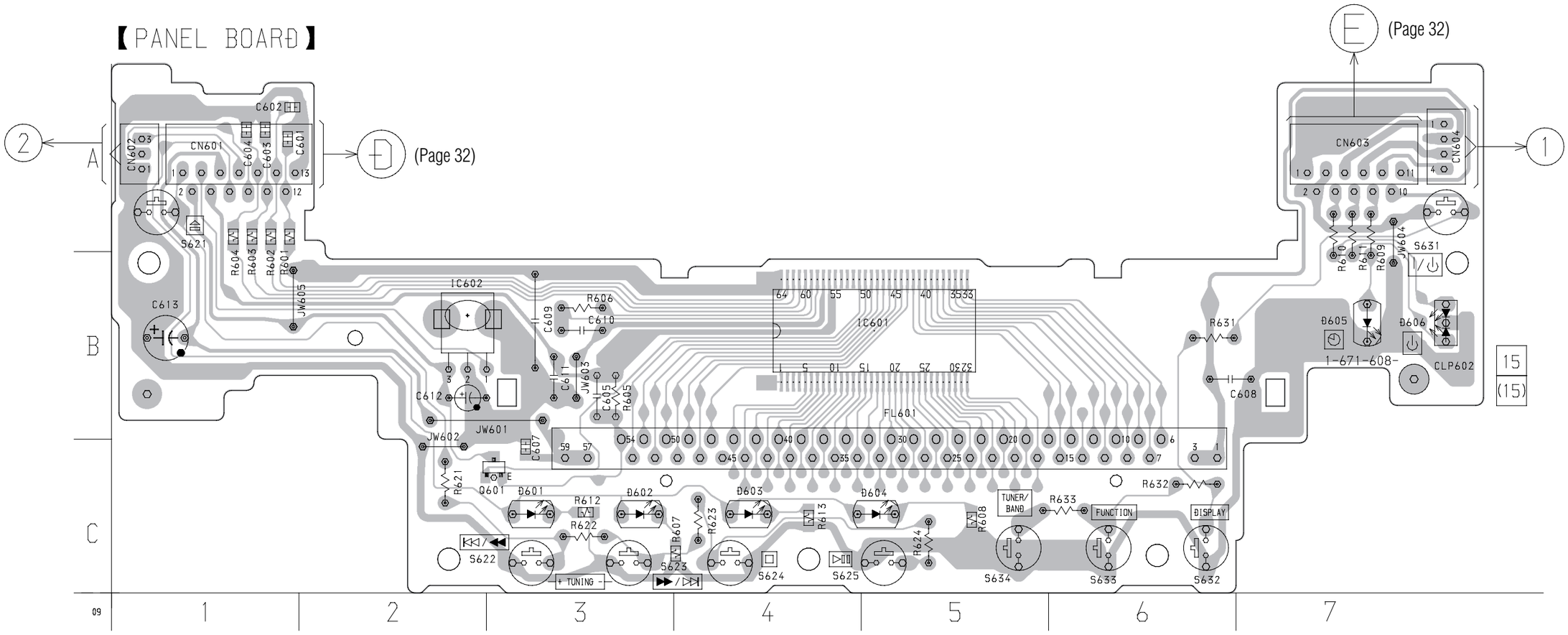
Ref. No.	Location	Ref. No.	Location
D901	B-2	D966	C-1
D902	B-1		
D903	B-1	IC901	C-2
D904	B-1		
D905	C-2	Q901	B-3
D906	B-3	Q961	C-2
D961	B-2	Q962	B-3
D962	B-2	Q963	C-3
D963	B-2	Q964	C-3
D964	B-2	Q965	C-2
D965	C-2	Q966	C-2

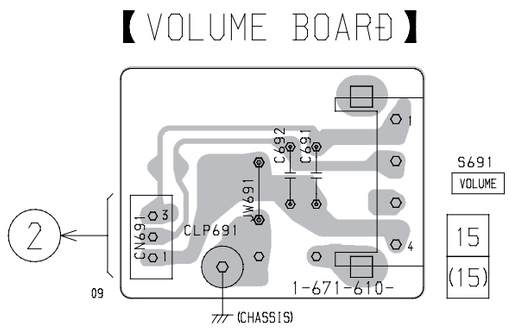
7-10. SCHEMATIC DIAGRAM – PANEL SECTION –

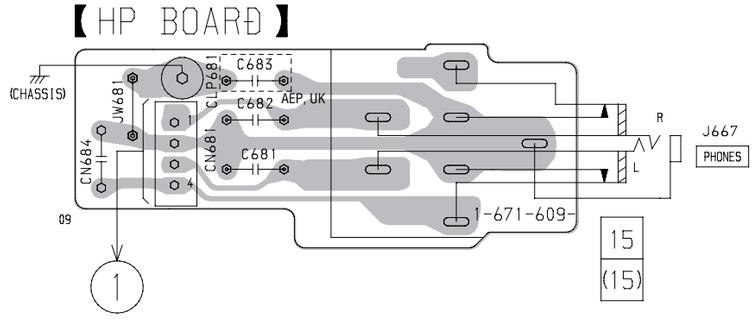


7-11. PRINTED WIRING BOARD – PANEL SECTION –

• See page 16 for Circuit Boards Location.



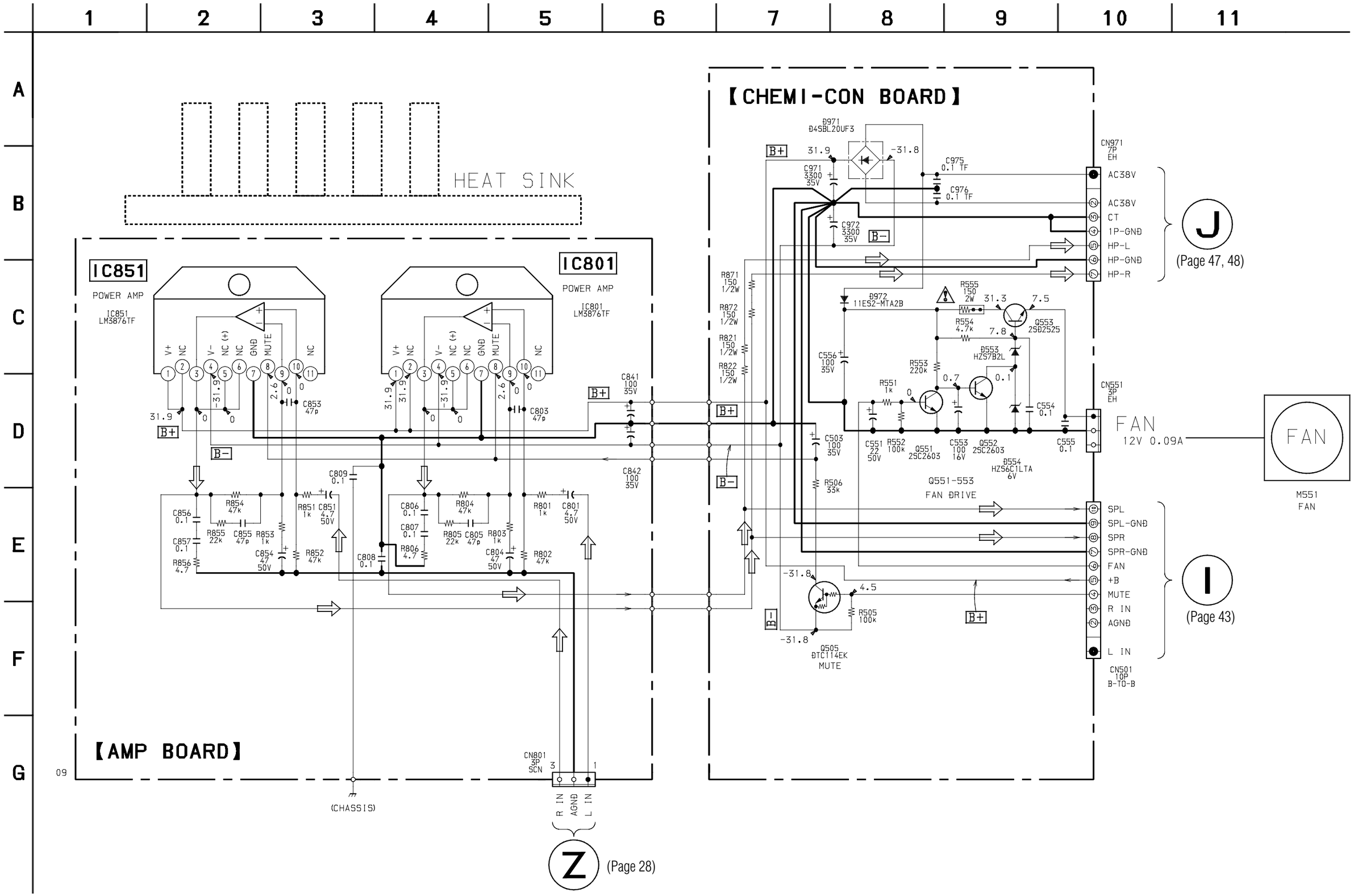




• Semiconductor Location

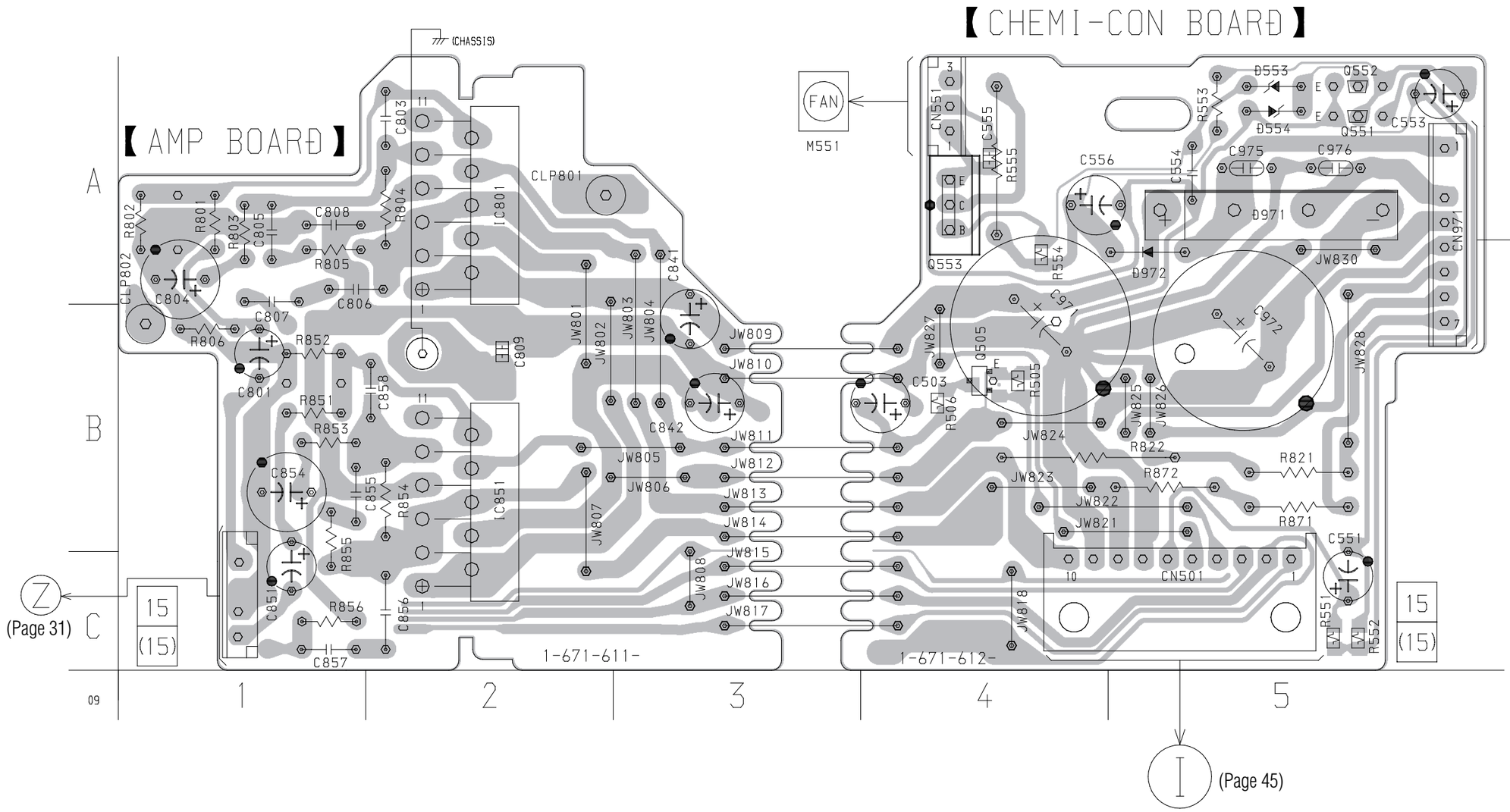
Ref. No.	Location
D601	C-3
D602	C-3
D603	C-4
D604	C-5
D605	B-7
D606	B-7
IC601	B-5
IC602	B-2
Q601	C-3

7-12. SCHEMATIC DIAGRAM – AMP SECTION –



7-13. PRINTED WIRING BOARD – AMP SECTION –

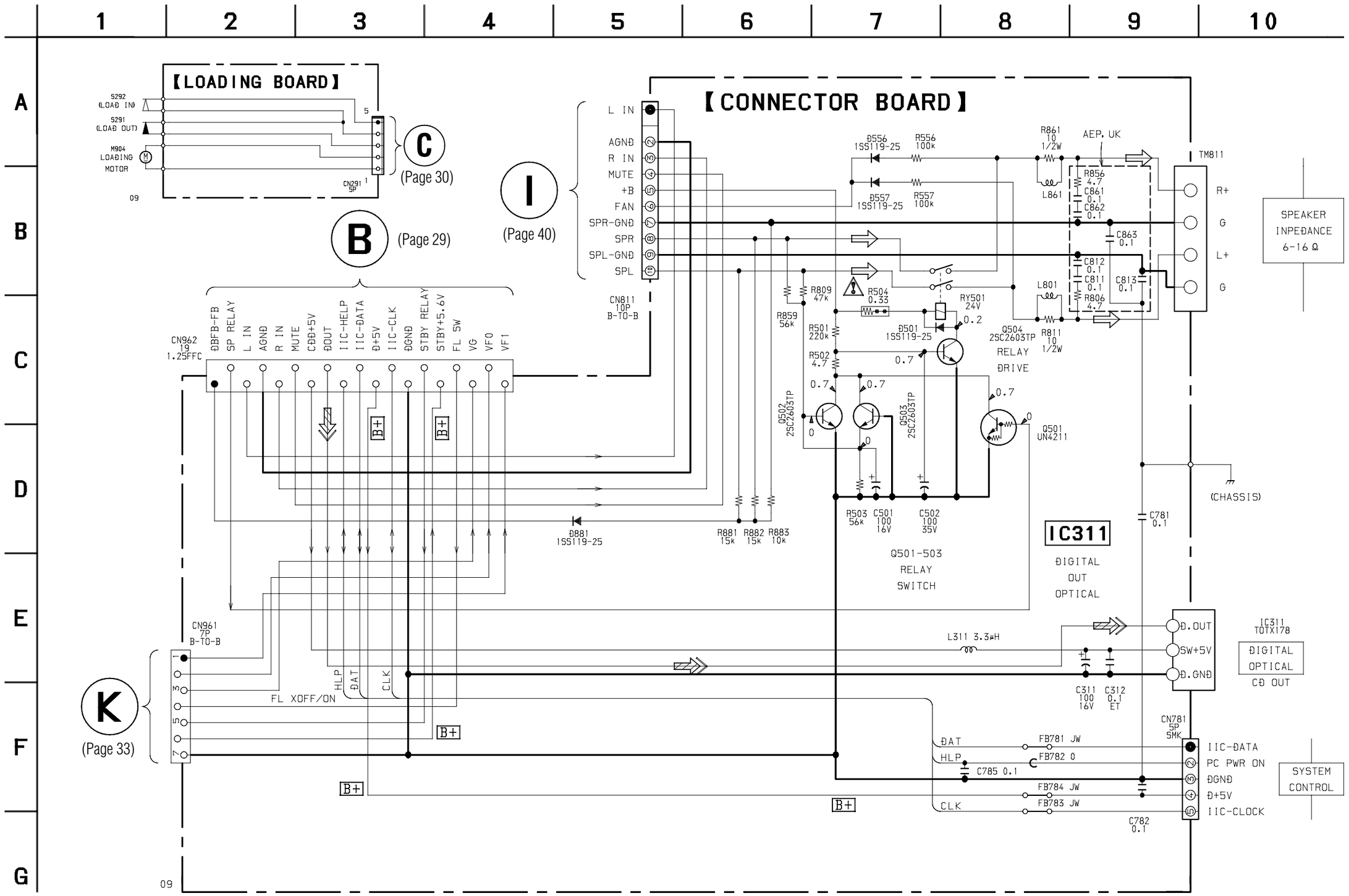
• See page 16 for Circuit Boards Location.



• Semiconductor Location

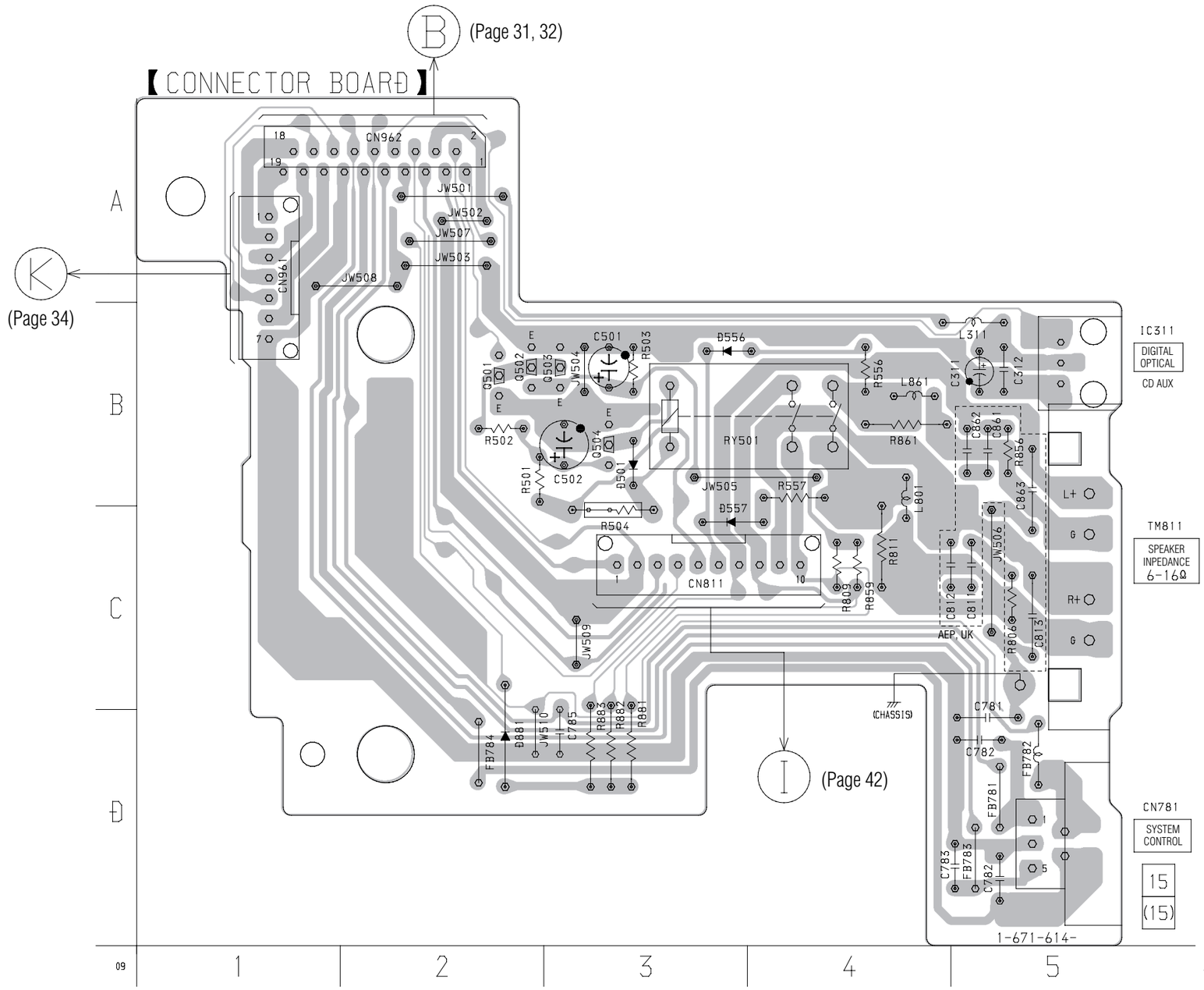
Ref. No.	Location
D553	A-5
D554	A-5
D971	A-5
D972	A-5
Q505	B-4
Q551	A-5
Q552	A-5
Q553	A-4

7-14. SCHEMATIC DIAGRAM – CONNECTOR SECTION –



7-15. PRINTED WIRING BOARD – CONNECTOR SECTION –

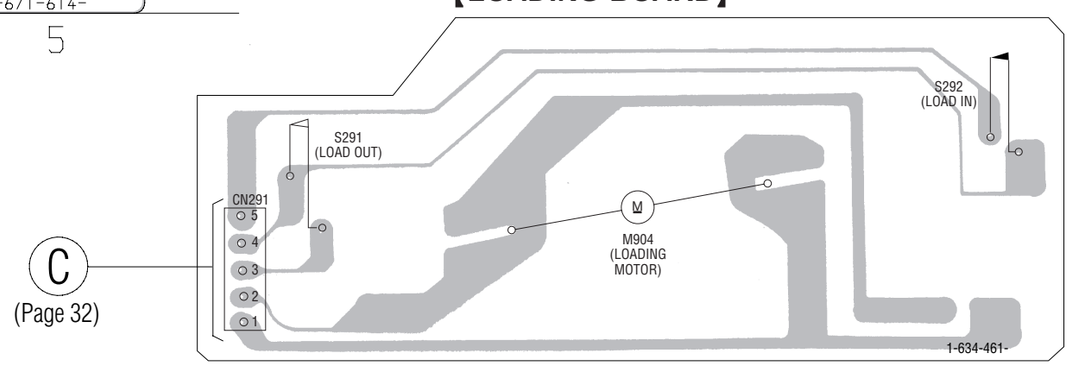
• See page 16 for Circuit Boards Location.



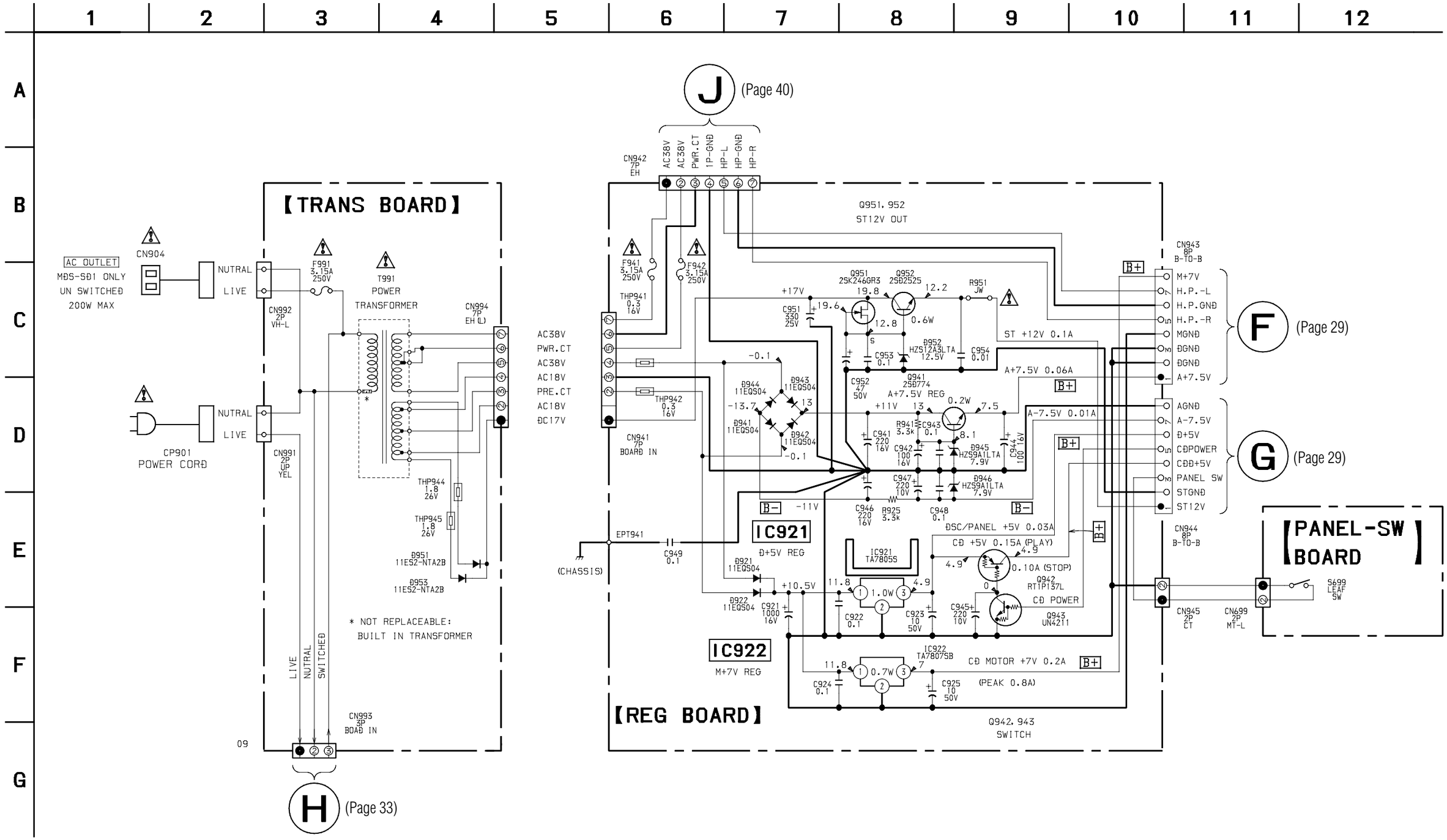
• Semiconductor Location

Ref. No.	Location
D501	B-3
D556	B-3
D557	C-3
D881	D-2
IC311	B-5
Q501	B-2
Q502	B-2
Q503	B-3
Q504	B-3

【LOADING BOARD】

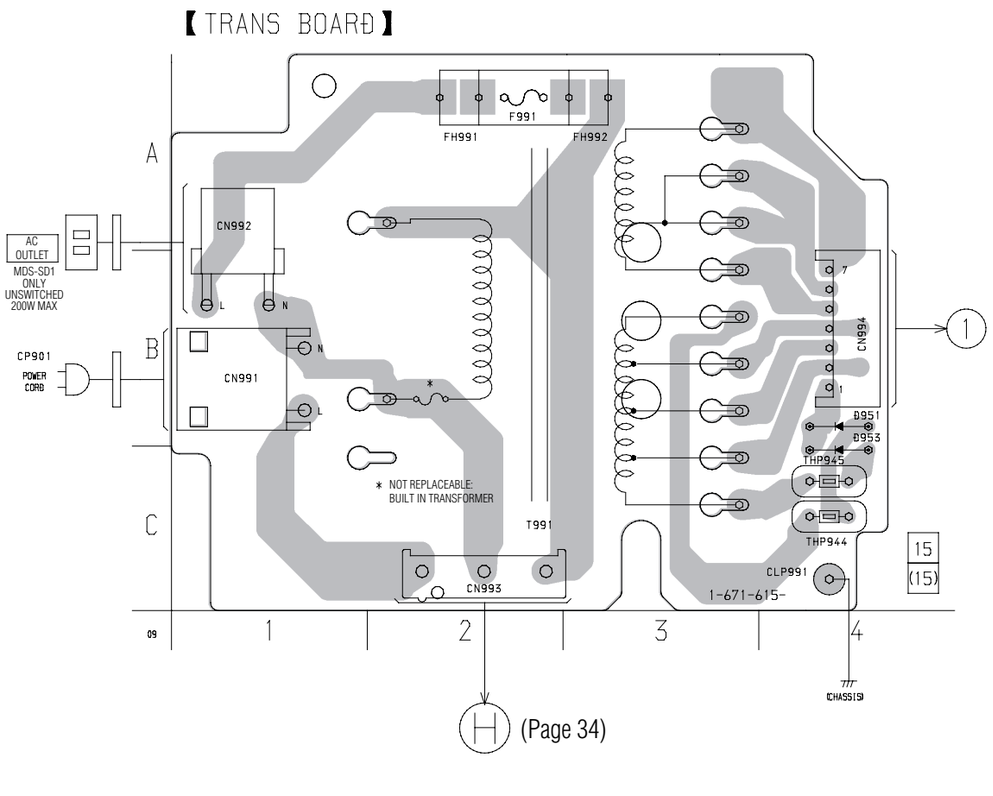


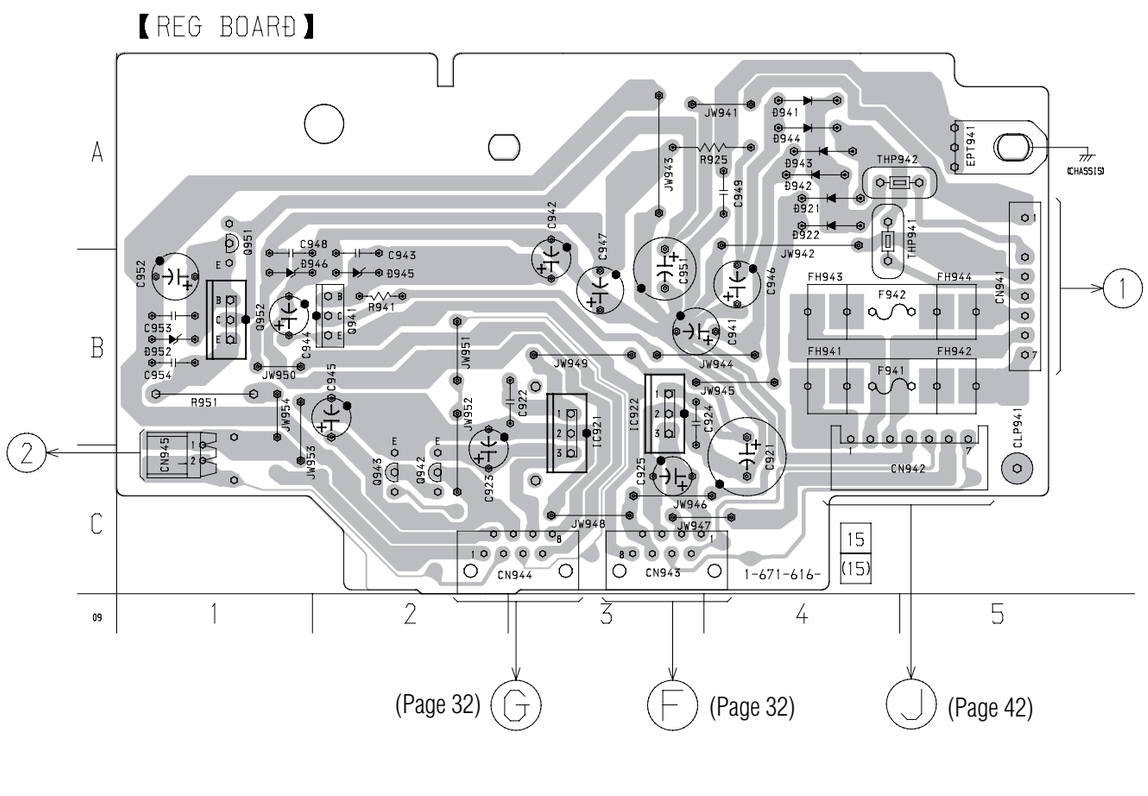
7-16. SCHEMATIC DIAGRAM – REG SECTION –

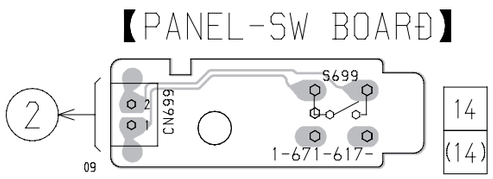


7-17. PRINTED WIRING BOARD – REG SECTION –

• See page 16 for Circuit Boards Location.







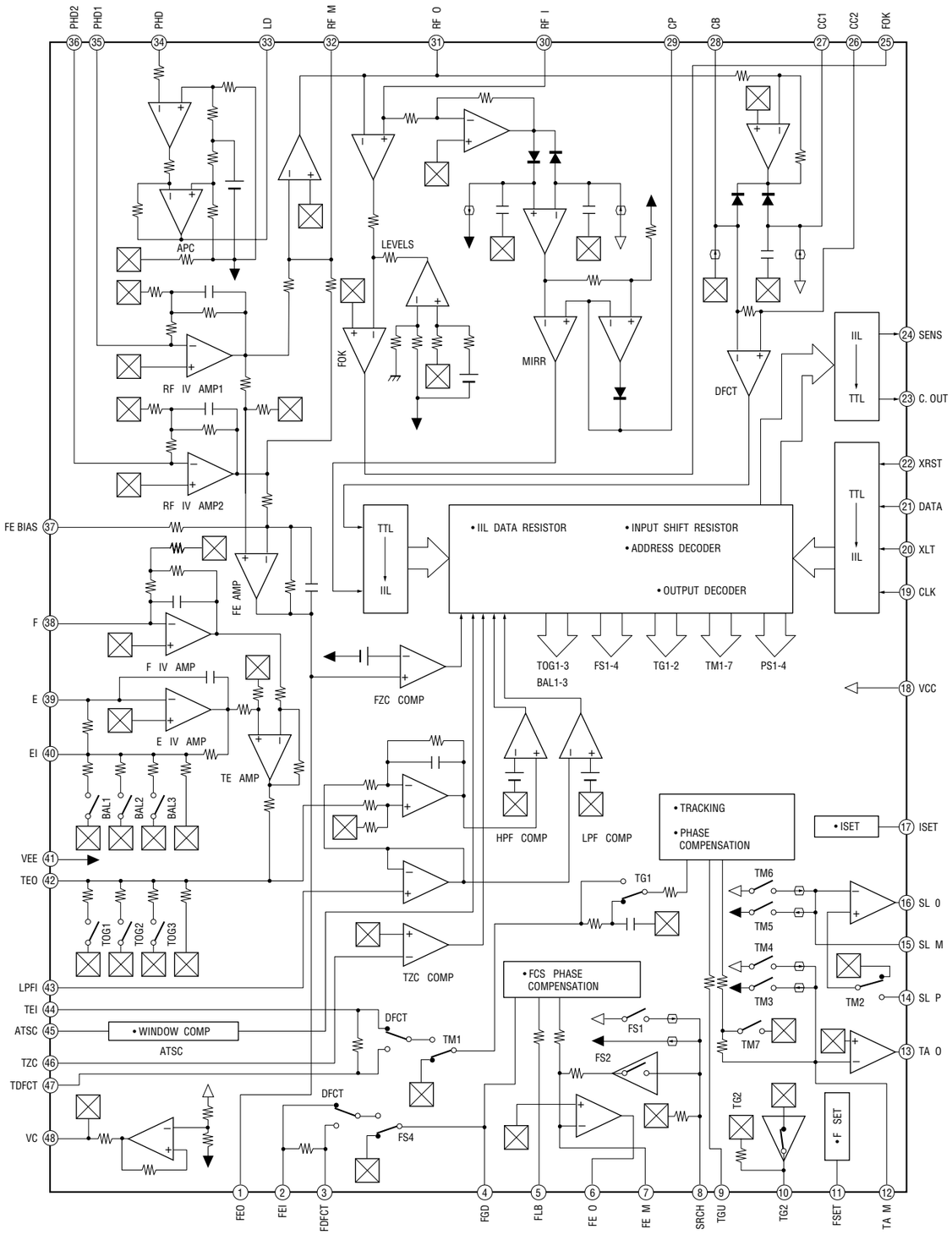
• Semiconductor Location

Ref. No.	Location
D921	A-4
D922	A-4
D941	A-4
D942	A-4
D943	A-4
D944	A-4
D945	B-2
D946	B-1
D952	B-1
IC921	B-3
IC922	B-3
Q941	B-2
Q942	C-2
Q943	C-2
Q951	A-1
Q952	B-1

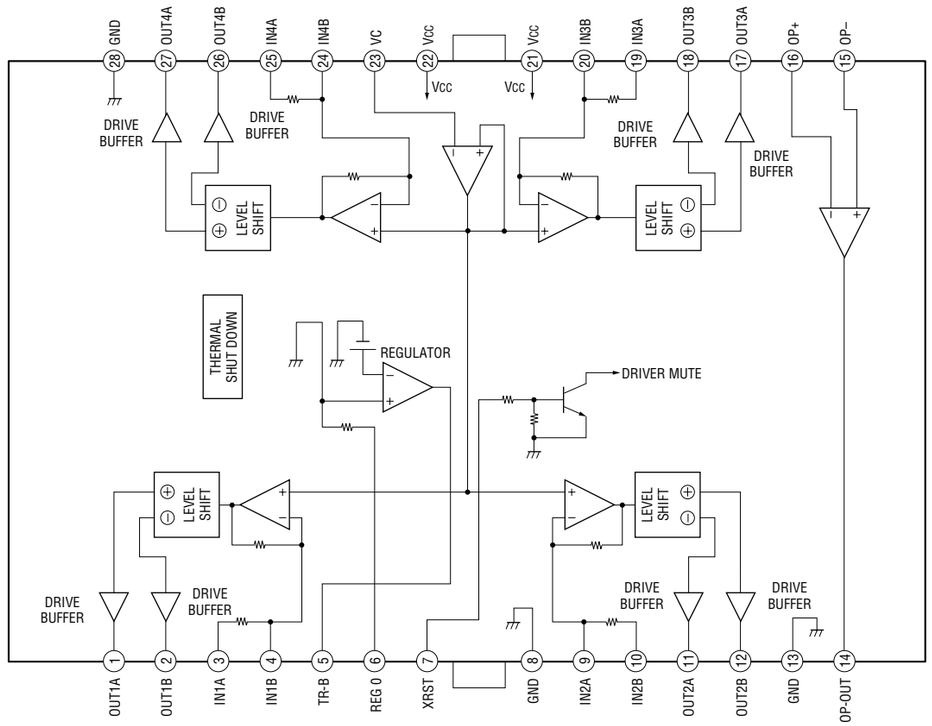
7-18. IC BLOCK DIAGRAMS

• **BD section**

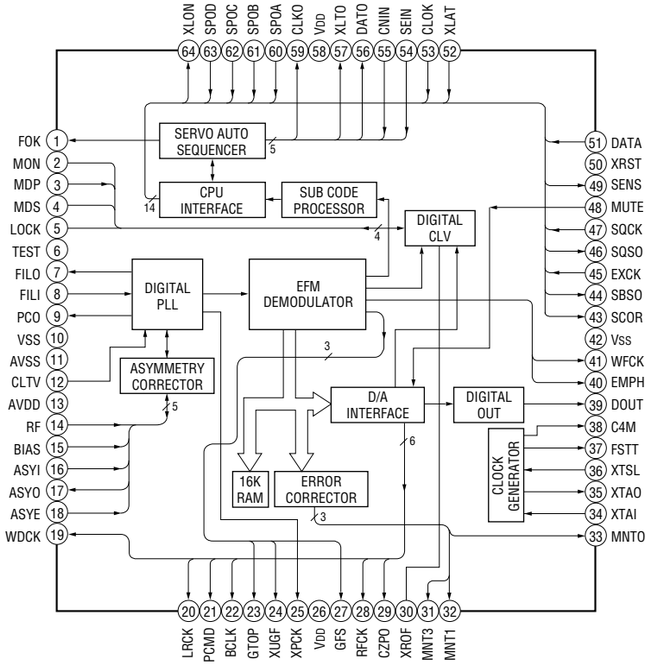
IC101 CXA1782BQ



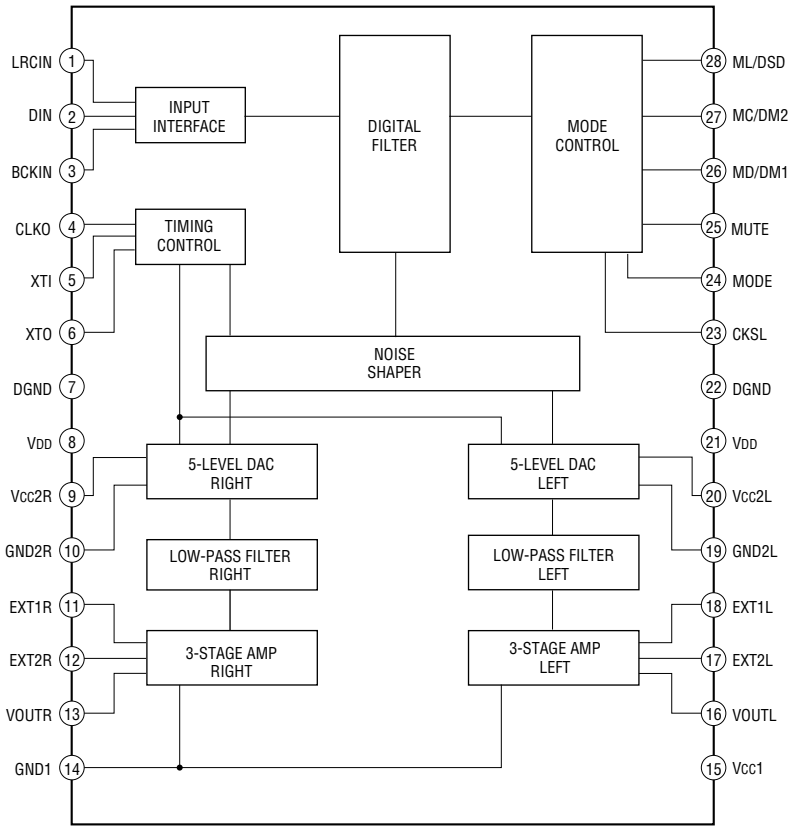
IC102 BA6397FP


GND OUT4A OUT4B IN4A IN4B VC VCC VCC VCC IN3B IN3A OUT3B OUT3A OP+ OP–
DRIVE BUFFER
LEVEL SHIFT
THERMAL SHUT DOWN
REGULATOR
DRIVER MUTE
OUT1A OUT1B IN1A IN1B TR-B REG O XRST GND IN2A IN2B OUT2A OUT2B GND OP-OUT

IC103 CXD2507AQ

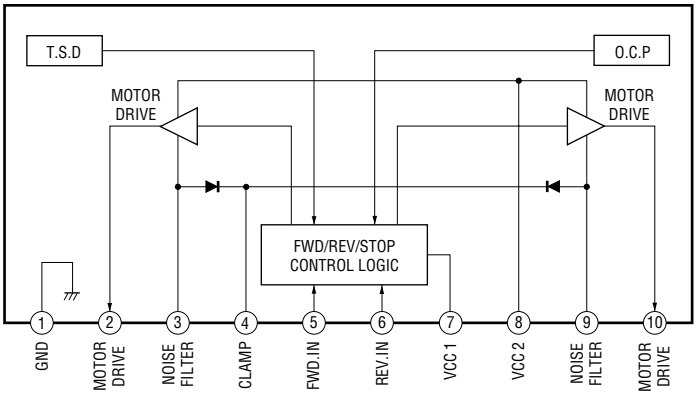

XLON SPOD SPOC SPOB SPOA CLKO VDD XLTO DATO CNIN SEIN CLOK XLAT
FOK MON MDP MDS LOCK TEST FILO FILI PCO VSS AVSS CLTV AVDD RF BIAS ASYI ASYO ASYE WDCK
SERVO AUTO SEQUENCER
CPU INTERFACE
SUB CODE PROCESSOR
DIGITAL CLV
DIGITAL PLL
EFM DEMODULATOR
ASYMMETRY CORRECTOR
D/A INTERFACE
DIGITAL OUT
16K RAM
ERROR CORRECTOR
CLOCK GENERATOR
DATA XRST SENS MUTE SQCK SQSO EXCK SBSO SCOR Vss WFCK EMPH DOUT C4M FSTT XTSL XTAO XTAI MNTO
LRCK PCMD BCLK GTOP XUGF XPCK VDD GFS RFCK CZPO XROF MNT3 MNT1

IC104 PCM1710U-R

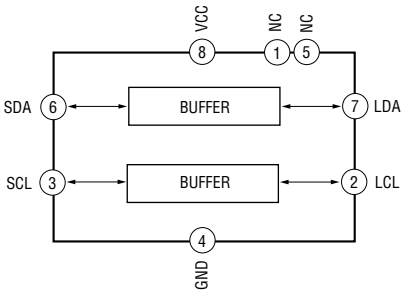


– MAIN Section –

IC351 LB1641



IC791 P82B715TD.118



7-19. IC PIN FUNCTIONS

• IC701 System Control (μPD780018AYGF-015-3BA) (MAIN Board)

Pin No.	Pin Name	I/O	Function
1	BD POWER	O	CD power control pin, “H”:CD POWER ON
2	PANEL SW	I	Front cover open/close switch, “H”:Open glass door, “L”:Close glass door
3 to 7	–	I	Not used
8	AC.CUT	I	AC power connection signal, “L”:Power is disconnected
9	VPP	–	Normally connected to the ground pin
10	X2	O	Main system clock output pin (5 MHz)
11	X1	I	Main system clock input pin (5 MHz)
12	VDD1	–	Positive power supply (+5V)
13	XT2	O	Sub system clock output pin (32 kHz)
14	XT1	I	Sub system clock output pin (32 kHz)
15	RESET	I	System reset input pin, “L”:RESET
16, 17	–	I	Not used
18	ENCODER A	I	Encoder input pin for jogging
19	ENCODER B	I	Encoder input pin for jogging
20	RDSCLK	I	RDS clock input pin (Not used)
21	RDSDAT	I	RDS data input pin (Not used)
22	SCOR	I	SCOR input pin
23	VDD0	–	Positive power supply of port (+5V)
24	ADREF	–	Reference voltage of A/D converter (+5V)
25	KEY1	I	Key input pin (Analog input)
26	KEY0	I	Key input pin (Analog input)
27 to 30	–	I	Not used
31	HP-SW	I	Headphone detection SW, “L”:No HP, “H”:HP
32	–	I	Not used
33	AVSS	–	A/D converter ground potential
34	–	I	Not used
35	FL.DAT	O	Serial data output for FL tube control IC (MSM9202-02)
36	FL.CLK	O	Serial clock output for FL tube control IC (MSM9202-02)
37	FL.LAT	O	Chip select output for FL tube control IC (MSM9202-02)
38	FL.RST	O	Reset signal output for FL tube control IC (MSM9202-02)
39	–	I	Not used
40	VSS1	–	Ground potential other than port and analog
41, 42	–	I	Not used
43	SQSI	I	CD sub code data input
44	–	I	Not used
45	SQCK	O	Clock output for reading CD sub code
46 to 48	–	I	Not used
49	IN-SW	I	CD tray close completion detection input, “L”:CLOSE
50	OUT-SW	I	CD tray open completion detection input, “L”:OPEN
51	HELP	I	Pin requesting power ON from the PC link adapter (optional), Normally “H”
52	FSW	O	Focus gain switch
53	SENSE	I	SENSE input pin
54	–	I	Not used
55	IIC DAT	I/O	System control communication data input/output pin
56	IIC CLOCK	I/O	System control communication clock input/output pin
57	CD-CLK	O	Serial clock for CD control
58	CD-DATA	O	Serial data for CD control
59	DF-LAT	O	Chip select signal for DA/DF
60	DSP-LAT	O	DSP IC and SSP IC chip select

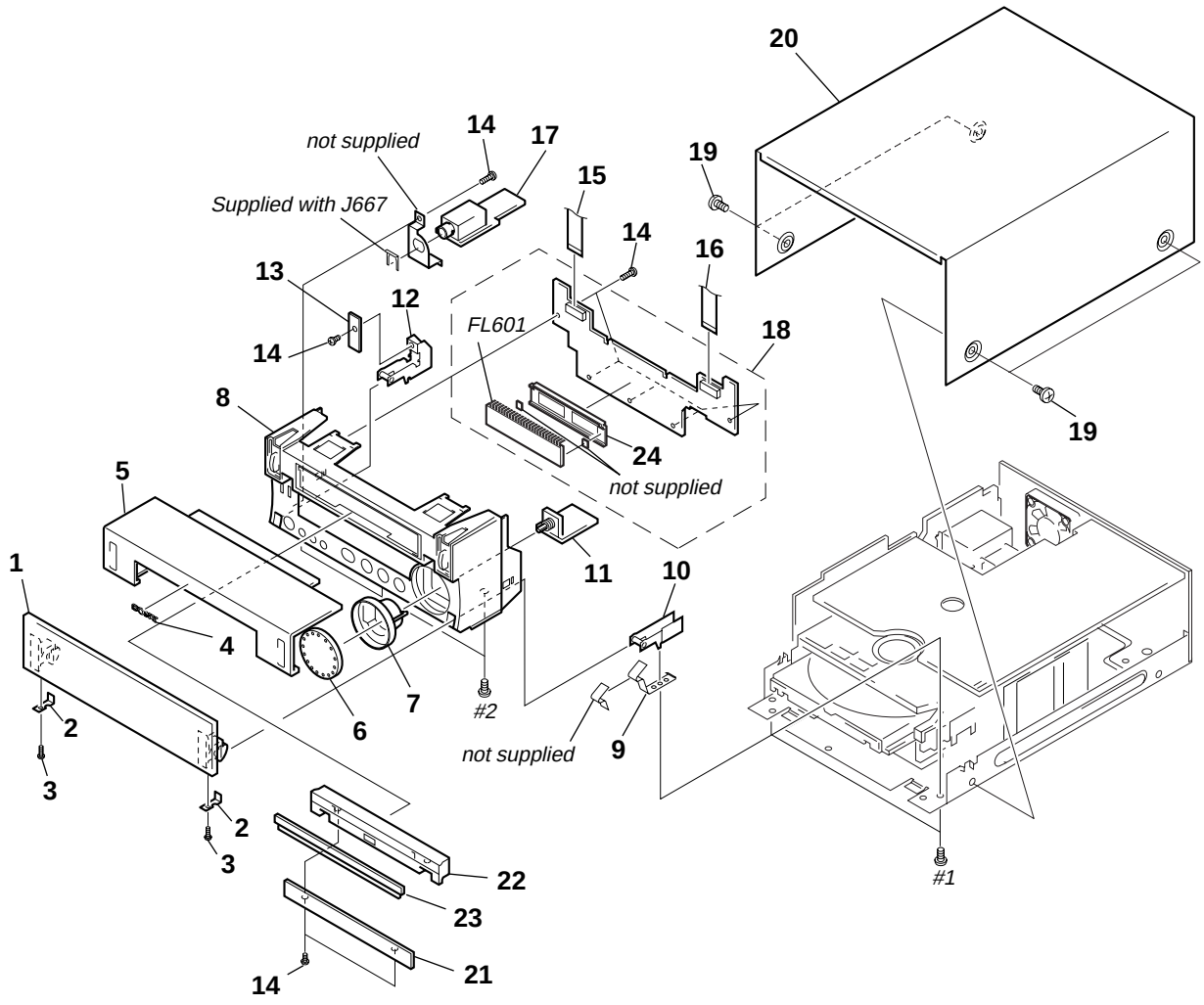
Pin No.	Pin Name	I/O	Function
61	LOAD IN	O	Tray loading motor control signal, “L”:Loading
62	LOAD OUT	O	Tray loading motor control signal, “L”:When OPEN
63	BD.RESET	O	IC reset signal for CD control, “L”:RESET
64	LIGHT	O	BLUE LED control port of front panel, “L”:LED ON
65	SDATA	O	Serial data for SOUND PROCESSOR IC101 (M62428AFP)
66	SCLOCK	O	Serial clock for SOUND PROCESSOR IC101 (M62428AFP)
67	SLAT1	O	Chip select for SOUND PROCESSOR IC101 (M62428AFP)
68	MUTE1	O	Audio mute signal, “H”:Power amplifier ICs (IC801, IC851) MUTE
69	MUTE2	O	Audio mute signal, “L”:Line mute (Q141, Q241) MUTE
70	STANDBY LED	O	Signal controlling LED which lights when power is OFF, “L”:LED ON
71	VSS0	–	Ground potential of port
72	ON LED	O	Signal controlling LED which lights when power is ON, “L”:LED ON
73	TIMER LED	O	Signal controlling LED which lights in timer standby, “H”:LED ON
74	–	I	Not used
75	FL DISP SW	O	Power ON/OFF signal for FL display, “H”:FL display ON
76	SP RELAY SW	O	Speaker relay control signal, “L”:Speaker relay ON
77 to 80	–	I	Not used
81	ON/XSTBY	O	System power control signal, “H”:Standby relay ON
82	STEREO	I	Tuner stereo signal, “L”:Stereo
83	TUNED	I	Tuner selection OK signal, “L”:TUNED
84	ST IDATA	I	Serial input data for tuner
85	ST ODATA	O	Serial output data for tuner
86	ST.CLOCK	O	Serial clock for tuner
87	ST LATCH	O	Chip select for tuner
88	ST MUTE	O	Tuner mute output
89	ST POWER	O	Tuner power signal (Not used)
90	SIRCS	I	SIRCS code input signal (Remote control signal input)
91	PCL	I	32 KHz clock monitor out 32.768 kHz signal is output in the test mode (Refer to page 12.)
92, 93	–	I	Not used
94	DEST1	I	Destination differentiation signal (Fixed at “H”)
95	DEST2	I	Destination differentiation signal (Fixed at “L”)
96	–	I	Not used
97	HP MUTE	O	HP mute signal output
98	MD-MUTE	O	MD REC OUT control signal “L”:MD REC OUT MUTE (“L” only for MD function)
99	TC-MUTE	O	REC OUT control signal of TAPE “L”:TAPE REC OUT MUTE (“L” only for TAPE function)
100	V/T	O	Function control signal “H”:TAPE, “L”:CS/BS

SECTION 8
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  HK : Hong Kong model
  SP : Singapore model

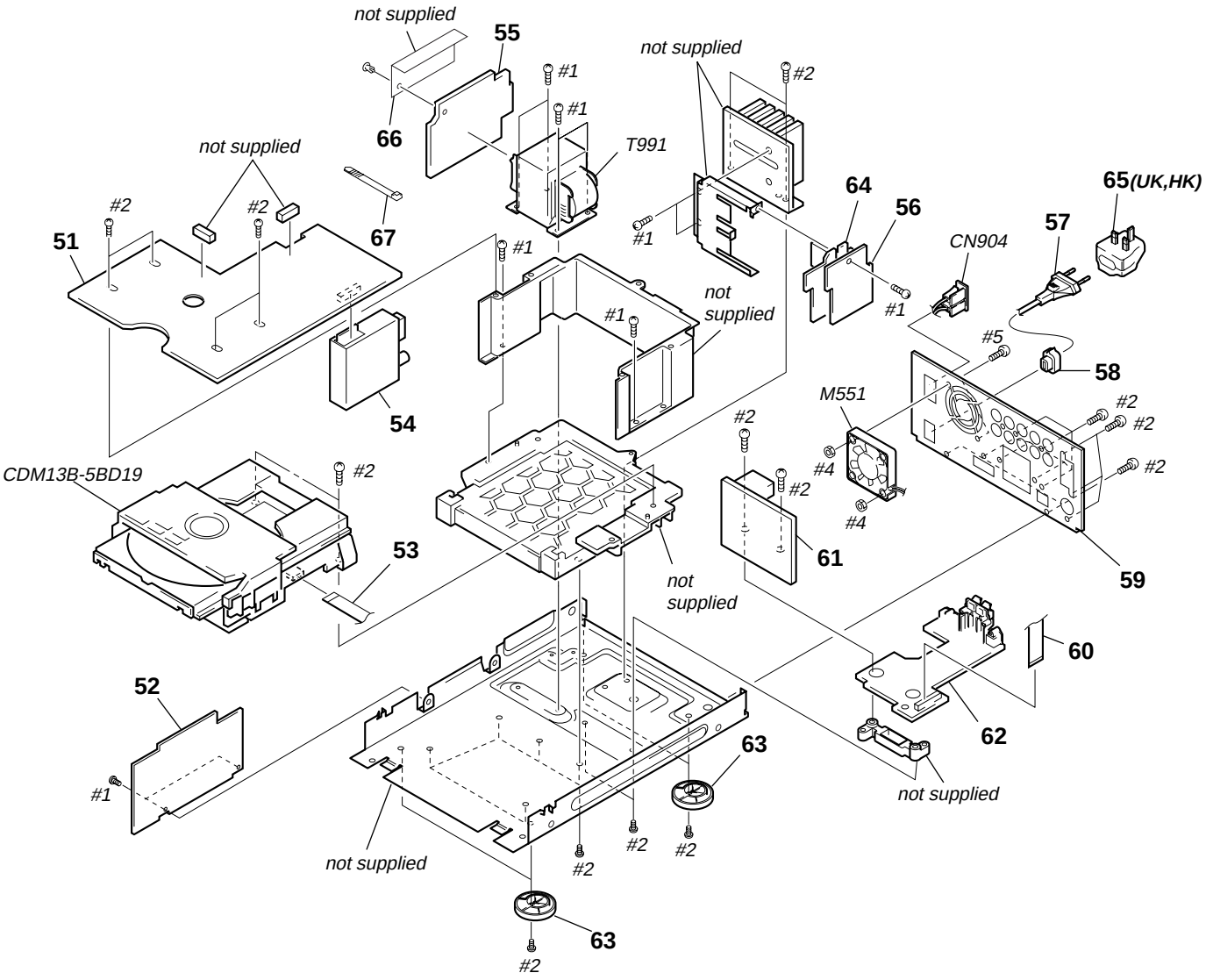
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

8-1. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	X-4950-580-1	GLASS ASSY (CD)	
2	4-212-584-01	BRACKET (SHAFT)	
3	4-993-007-01	SCREW (M2.6X6), +P TAPPING	
4	4-942-636-21	EMBLEM (NO.3.5), SONY	
5	4-212-538-11	PANEL (AL-CD), FRONT	
6	X-4950-364-1	KNOB (VOL) ASSY	
7	4-212-542-11	RING (VOL)	
8	X-4950-995-1	PANEL ASSY (CD), FRONT	
9	4-212-580-11	SPRING (GLASS)	
10	X-4950-999-1	BRACKET (R) ASSY	
* 11	1-671-610-11	VOLUME BOARD	
12	X-4950-998-1	BRACKET (L) ASSY	
* 13	1-671-617-11	PANEL-SW BOARD	
14	4-951-620-01	SCREW (2.6X8), +BVTP	
15	1-769-940-11	WIRE (FLAT TYPE) (11 CORE)	
16	1-769-972-11	WIRE (FLAT TYPE) (13 CORE)	
* 17	1-671-609-11	HP BOARD	
* 18	A-4419-060-A	PANEL BOARD, COMPLETE	
19	3-363-099-51	SCREW (CASE 3 TP2)	
* 20	4-212-561-31	CASE	
21	4-212-540-11	PANEL (AL-CD), LOADING	
22	4-212-541-11	PANEL (CD), LOADING	
23	4-212-545-11	PLATE (CD), ORNAMENTAL	
* 24	4-212-590-11	HOLDER (FL)	
FL601	1-517-805-11	INDICATOR TUBE, FLUORESCENT	

8-2. CHASSIS SECTION

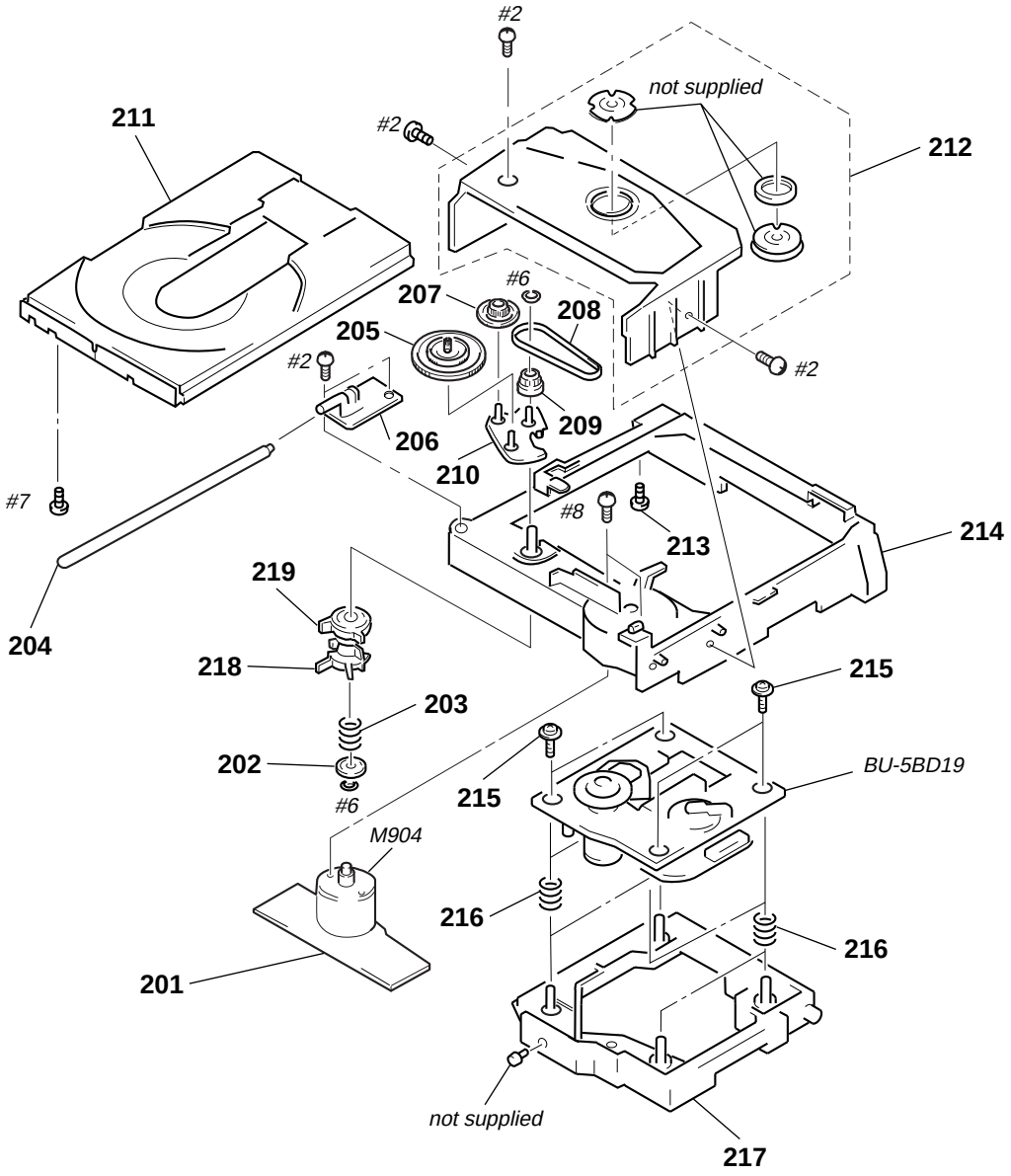


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 51	A-4419-059-A	MAIN BOARD, COMPLETE (AEP,UK)	
* 51	A-4419-070-A	MAIN BOARD, COMPLETE (SP,HK)	
* 52	A-4419-068-A	REG BOARD, COMPLETE	
53	1-790-305-11	WIRE (FLAT TYPE) (19 CORE)	
54	1-693-408-11	TUNER	
* 55	1-671-615-11	TRANS BOARD	
* 56	A-4419-064-A	CHEMI-CON BOARD, COMPLETE	
⚠57	1-575-651-91	CORD, POWER	
* 58	3-703-244-00	BUSHING (2104), CORD	
* 59	4-212-564-11	PANEL (CD), BACK	
60	1-773-108-11	WIRE (FLAT TYPE) (19 CORE)(100mm)	

Ref. No.	Part No.	Description	Remark
* 61	A-4419-065-A	SUB-TRANS BOARD, COMPLETE	
* 62	1-671-614-11	CONNECTOR BOARD	
63	X-4950-994-1	FOOT ASSY	
* 64	1-671-611-11	AMP BOARD	
⚠65	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK,HK)	
66	3-531-576-01	RIVET	
67	3-655-653-01	BAND (TAITON), BINDING	
⚠CN904	1-526-794-11	OUTLET, AC	
M551	1-698-997-21	FAN, D.C.	
⚠T991	1-433-478-11	TRANSFORMER, POWER	

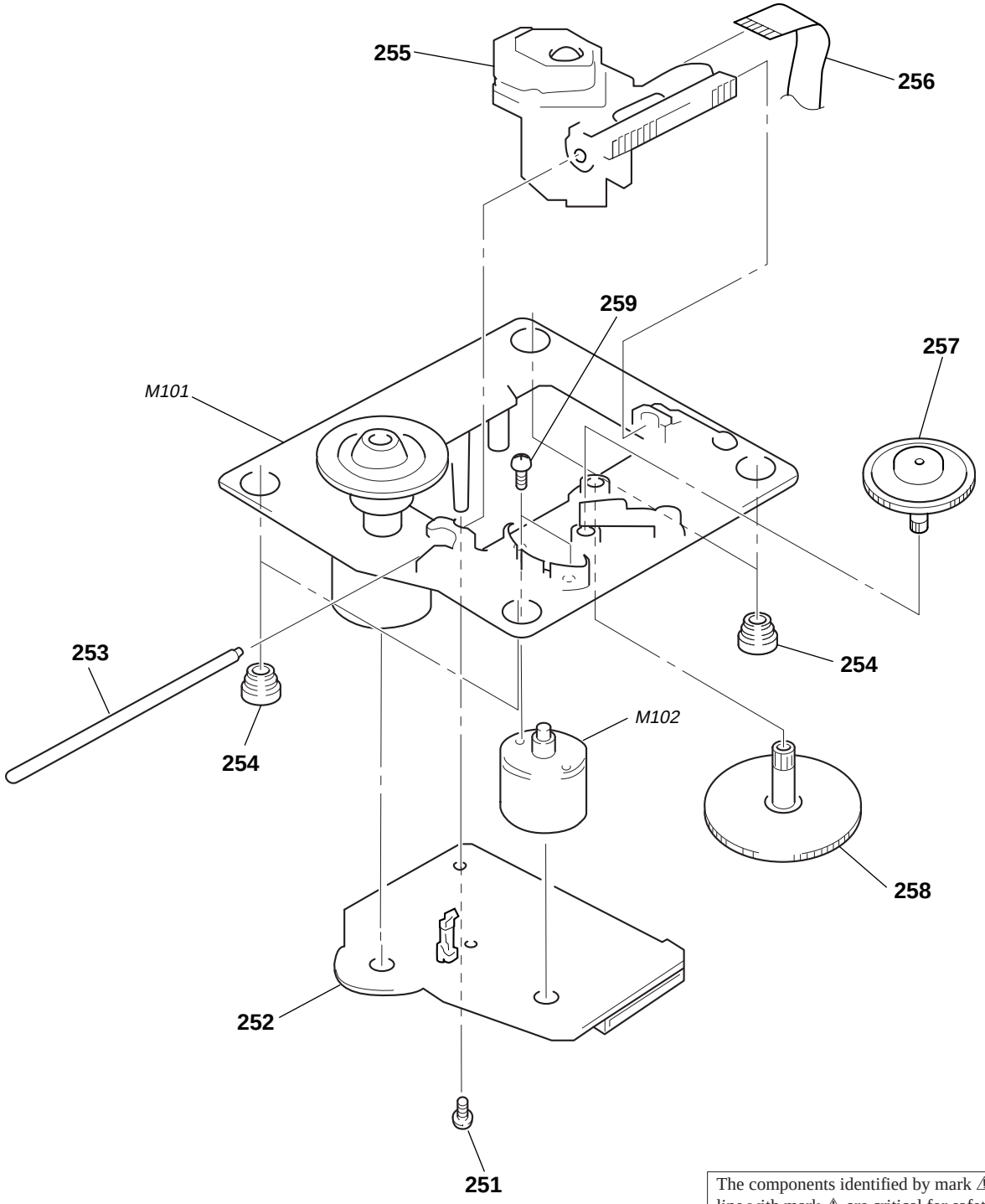
8-3. MECHANISM DECK SECTION (CDM13B-5BD19)



Ref. No.	Part No.	Description	Remark
* 201	1-634-461-11	LOADING BOARD	
202	4-927-654-01	WASHER (LIMITER)	
203	3-659-338-00	SPRING, COMPRESSION	
204	4-929-764-01	SHAFT (TABLE GUIDE)	
205	4-927-620-01	GEAR (P)	
206	4-944-006-11	BEARING	
207	4-927-628-01	GEAR (C)	
208	4-927-649-01	BELT	
209	4-929-724-01	PULLEY (B)	
210	X-4947-265-1	ARM ASSY, SWING	

Ref. No.	Part No.	Description	Remark
211	4-944-012-01	TABLE, DISC	
212	A-4604-752-A	HOLDER (MG) ASSY	
* 213	4-917-583-21	BRACKET, YOKE	
214	X-4941-462-1	CHASSIS (MD) ASSY	
215	4-933-134-01	SCREW (+PTPWH M2.6X6)	
216	4-958-593-01	SPRING (BU), COMPRESSION	
217	4-929-747-01	HOLDER (BU)	
218	4-929-727-01	CAM (A)	
219	4-929-729-01	CAM (B)	
M904	A-4660-307-A	MOTOR (L) ASSY (LOADING)	

8-4. BASE UNIT SECTION (BU-5BD19)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
251	4-951-620-01	SCREW (2.6X8), +BVTP	
* 252	A-4673-402-B	BD BOARD, COMPLETE	
253	4-917-565-01	SHAFT, SLED	
254	4-951-940-01	INSULATOR (BU)	
⚠255	8-848-379-31	OPTICAL PICK-UP KSS-213B/S-N	
256	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
257	4-917-567-01	GEAR (M)	
258	4-917-564-01	GEAR (P), FLATNESS	
259	3-713-786-51	SCREW +P 2X3	
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	

AMP **BD**

SECTION 9
ELECTRICAL PARTS LIST

Note:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H
- Abbreviation
  HK : Hong Kong model
  SP : Singapore model

Ref. No.	Part No.	Description			Remark
*	1-671-611-11	AMP BOARD			
		*********			
		< CAPACITOR >			
C801	1-124-720-11	ELECT	4.7uF	20%	50V
C803	1-162-215-31	CERAMIC	47PF	5%	50V
C804	1-124-724-11	ELECT	47uF	20%	50V
C805	1-162-215-31	CERAMIC	47PF	5%	50V
C806	1-164-159-11	CERAMIC	0.1uF		50V
C807	1-164-159-11	CERAMIC	0.1uF		50V
C808	1-164-159-11	CERAMIC	0.1uF		50V
C809	1-163-038-91	CERAMIC	0.1uF		25V
C841	1-126-948-11	ELECT	100uF	20%	35V
C842	1-126-948-11	ELECT	100uF	20%	35V
C851	1-124-720-11	ELECT	4.7uF	20%	50V
C853	1-162-215-31	CERAMIC	47PF	5%	50V
C854	1-124-724-11	ELECT	47uF	20%	50V
C855	1-162-215-31	CERAMIC	47PF	5%	50V
C856	1-164-159-11	CERAMIC	0.1uF		50V
C857	1-164-159-11	CERAMIC	0.1uF		50V
		< IC >			
IC801	8-759-331-41	IC LM3876TF			
IC851	8-759-331-41	IC LM3876TF			
		< RESISTOR >			
R801	1-249-417-11	CARBON	1K	5%	1/4W F
R802	1-249-437-11	CARBON	47K	5%	1/4W
R803	1-249-417-11	CARBON	1K	5%	1/4W F
R804	1-249-437-11	CARBON	47K	5%	1/4W
R805	1-249-433-11	CARBON	22K	5%	1/4W
R806	1-249-389-11	CARBON	4.7	5%	1/4W F
R851	1-249-417-11	CARBON	1K	5%	1/4W F
R852	1-249-437-11	CARBON	47K	5%	1/4W
R853	1-249-417-11	CARBON	1K	5%	1/4W F
R854	1-249-437-11	CARBON	47K	5%	1/4W
R855	1-249-433-11	CARBON	22K	5%	1/4W
R856	1-249-389-11	CARBON	4.7	5%	1/4W F
**********					
*	A-4673-402-B	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-126-607-11	ELECT CHIP	47uF	20%	4V
C102	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V

Ref. No.	Part No.	Description			Remark
C103	1-164-346-11	CERAMIC CHIP	1uF		16V
C105	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C106	1-164-690-91	CERAMIC CHIP	0.0022uF	5%	50V
C107	1-164-690-91	CERAMIC CHIP	0.0022uF	5%	50V
C108	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C109	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C110	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C111	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C112	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C113	1-164-690-91	CERAMIC CHIP	0.0022uF	5%	50V
C114	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C115	1-126-607-11	ELECT CHIP	47uF	20%	4V
C116	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C117	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C118	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C119	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C120	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C121	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C122	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-126-607-11	ELECT CHIP	47uF	20%	4V
C125	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C126	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C127	1-164-690-91	CERAMIC CHIP	0.0022uF	5%	50V
C128	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C129	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C130	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C131	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C132	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C133	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C134	1-164-346-11	CERAMIC CHIP	1uF		16V
C135	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C136	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C137	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C139	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C140	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C142	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C145	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C146	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C147	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C148	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C149	1-164-346-11	CERAMIC CHIP	1uF		16V
C153	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C154	1-163-235-11	CERAMIC CHIP	22PF	5%	50V

Ref. No.	Part No.	Description			Remark
		< CONNECTOR >			
CNU101	1-770-014-11	CONNECTOR, FFC/FPC 16P			
CNU102	1-770-013-11	CONNECTOR, FFC/FPC 19P			
		< IC >			
IC101	8-752-074-34	IC CXA1782BQ			
IC102	8-759-291-06	IC BA6397FP			
IC103	8-752-372-94	IC CXD2507AQ			
IC104	8-759-185-29	IC PCM1710U-B			
		< TRANSISTOR >			
Q101	8-729-010-08	TRANSISTOR MSB710-R			
Q102	8-729-424-08	TRANSISTOR UN2111			
Q103	8-729-421-22	TRANSISTOR UN2211			
		< RESISTOR >			
R102	1-216-001-00	METAL CHIP	10	5%	1/10W
R103	1-216-049-91	RES,CHIP	1K	5%	1/10W
R104	1-216-097-91	RES,CHIP	100K	5%	1/10W
R105	1-216-093-91	RES,CHIP	68K	5%	1/10W
R106	1-216-093-91	RES,CHIP	68K	5%	1/10W
R107	1-216-093-91	RES,CHIP	68K	5%	1/10W
R108	1-216-093-91	RES,CHIP	68K	5%	1/10W
R109	1-216-097-91	RES,CHIP	100K	5%	1/10W
R112	1-216-083-00	METAL CHIP	27K	5%	1/10W
R113	1-216-083-00	METAL CHIP	27K	5%	1/10W
R114	1-216-101-00	METAL CHIP	150K	5%	1/10W
R115	1-216-101-00	METAL CHIP	150K	5%	1/10W
R116	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R117	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R118	1-216-049-91	RES,CHIP	1K	5%	1/10W
R119	1-216-089-91	RES,CHIP	47K	5%	1/10W
R120	1-216-089-91	RES,CHIP	47K	5%	1/10W
R121	1-216-114-00	RES,CHIP	510K	5%	1/10W
R122	1-216-097-91	RES,CHIP	100K	5%	1/10W
R123	1-216-099-00	METAL CHIP	120K	5%	1/10W
R124	1-216-091-00	METAL CHIP	56K	5%	1/10W
R125	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R126	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R127	1-216-089-91	RES,CHIP	47K	5%	1/10W
R128	1-216-105-91	RES,CHIP	220K	5%	1/10W
R129	1-216-049-91	RES,CHIP	1K	5%	1/10W
R130	1-216-079-00	METAL CHIP	18K	5%	1/10W
R131	1-216-079-00	METAL CHIP	18K	5%	1/10W
R132	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R133	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R134	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R135	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R136	1-216-073-00	METAL CHIP	10K	5%	1/10W
R137	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R138	1-216-049-91	RES,CHIP	1K	5%	1/10W
R139	1-216-033-00	METAL CHIP	220	5%	1/10W
R140	1-216-081-00	METAL CHIP	22K	5%	1/10W
R141	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R142	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R143	1-216-121-91	RES,CHIP	1M	5%	1/10W
R144	1-216-073-00	METAL CHIP	10K	5%	1/10W
R145	1-216-097-91	RES,CHIP	100K	5%	1/10W
R146	1-216-097-91	RES,CHIP	100K	5%	1/10W
R147	1-216-049-91	RES,CHIP	1K	5%	1/10W
R148	1-216-049-91	RES,CHIP	1K	5%	1/10W
R149	1-216-049-91	RES,CHIP	1K	5%	1/10W
R150	1-216-037-00	METAL CHIP	330	5%	1/10W
R151	1-216-037-00	METAL CHIP	330	5%	1/10W
R152	1-216-037-00	METAL CHIP	330	5%	1/10W
R153	1-216-082-00	RES,CHIP	24K	5%	1/10W
R154	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R156	1-216-085-00	METAL CHIP	33K	5%	1/10W
R157	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R158	1-216-001-00	METAL CHIP	10	5%	1/10W
		< VARIABLE RESISTOR >			
RV101	1-223-587-11	RES, ADJ, CARBON 22K			
RV102	1-223-587-11	RES, ADJ, CARBON 22K			
RV103	1-223-587-11	RES, ADJ, CARBON 22K			
		< SWITCH >			
S101	1-572-085-11	SWITCH, LEAF (LIMIT)			
		< VIBRATOR >			
X101	1-579-280-11	VIBRATOR, CRYSTAL (16.9344MHz)			
**********					
*	A-4419-064-A	CHEMI-CON BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C503	1-126-948-11	ELECT	100uF	20%	35V
C551	1-128-131-11	ELECT	22uF	20%	50V
C553	1-126-933-11	ELECT	100uF	20%	16V
C554	1-164-159-11	CERAMIC	0.1uF		50V
C555	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C556	1-126-948-11	ELECT	100uF	20%	35V
C971	1-126-042-11	ELECT	3300uF	20%	35V
C972	1-126-042-11	ELECT	3300uF	20%	35V
C975	1-136-165-00	FILM	0.1uF	5%	50V
C976	1-136-165-00	FILM	0.1uF	5%	50V
		< CONNECTOR >			
* CN501	1-770-729-11	CONNECTOR, BOARD TO BOARD 10P			
* CN551	1-564-506-11	PLUG, CONNECTOR 3P			
		< DIODE >			
D553	8-719-933-47	DIODE HZS7B2L			
D554	8-719-933-39	DIODE HZS6C1L			
D971	8-719-062-40	DIODE D4SBL20UF3			
D972	8-719-024-99	DIODE 11ES2-NTA2B			
		< TRANSISTOR >			
Q505	8-729-900-53	TRANSISTOR DTC114EK			
Q551	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q552	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q553	8-729-026-68	TRANSISTOR 2SD2525(TP)			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R505	1-216-097-91	RES,CHIP	100K	5%	1/10W
R506	1-216-085-00	METAL CHIP	33K	5%	1/10W
R551	1-216-049-91	RES,CHIP	1K	5%	1/10W
R552	1-216-097-91	RES,CHIP	100K	5%	1/10W
R553	1-247-887-00	CARBON	220K	5%	1/4W
R554	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R821	1-260-089-11	CARBON	150	5%	1/2W
R822	1-260-089-11	CARBON	150	5%	1/2W
R871	1-260-089-11	CARBON	150	5%	1/2W
R872	1-260-089-11	CARBON	150	5%	1/2W
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*	1-671-614-11	CONNECTOR BOARD			
		**********			
		< CAPACITOR >			
C311	1-126-933-11	ELECT	100uF	20%	16V
C312	1-164-159-11	CERAMIC	0.1uF		50V
C501	1-126-933-11	ELECT	100uF	20%	16V
C502	1-126-948-11	ELECT	100uF	20%	35V
C781	1-164-159-11	CERAMIC	0.1uF		50V
C782	1-164-159-11	CERAMIC	0.1uF		50V
C785	1-164-159-11	CERAMIC	0.1uF		50V
C811	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
C812	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
C813	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
C861	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
C862	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
C863	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
		< CONNECTOR >			
* CN781	1-566-856-11	SOCKET, CONNECTOR 5P			
CN811	1-766-921-11	CONNECTOR, BOARD TO BOARD 10P			
* CN961	1-774-813-11	CONNECTOR, BOARD TO BOARD 7P			
CN962	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P			
		< DIODE >			
D501	8-719-911-19	DIODE 1SS119-25			
D556	8-719-911-19	DIODE 1SS119-25			
D557	8-719-911-19	DIODE 1SS119-25			
D881	8-719-911-19	DIODE 1SS119-25			
		< FERRITE BEAD >			
FB782	1-412-473-21	INDUCTOR	0UH		
		< IC >			
IC311	8-749-923-04	IC TOTX178 (DIGITAL OPTICAL CD AUX)			
		< COIL >			
L311	1-410-322-11	INDUCTOR	3.3uH		
L801	1-420-872-00	COIL, AIR-CORE			
L861	1-420-872-00	COIL, AIR-CORE			
		< TRANSISTOR >			
Q501	8-729-029-66	TRANSISTOR DTC114ESA			
Q502	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q503	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q504	8-729-620-05	TRANSISTOR 2SC2603-EF			
		< RESISTOR >			
R501	1-247-887-00	CARBON	220K	5%	1/4W
R502	1-249-389-11	CARBON	4.7	5%	1/4W F
R503	1-249-438-11	CARBON	56K	5%	1/4W
⚠ R504	1-219-122-91	FUSIBLE	0.33	5%	1/4W F
R556	1-249-441-11	CARBON	100K	5%	1/4W
R557	1-249-441-11	CARBON	100K	5%	1/4W
R806	1-249-389-11	CARBON	4.7	5%	1/4W F (AEP,UK)
R809	1-249-437-11	CARBON	47K	5%	1/4W
R811	1-260-076-11	CARBON	10	5%	1/2W
R856	1-249-389-11	CARBON	4.7	5%	1/4W F (AEP,UK)
R859	1-249-438-11	CARBON	56K	5%	1/4W
R861	1-260-076-11	CARBON	10	5%	1/2W
R881	1-249-431-11	CARBON	15K	5%	1/4W
R882	1-249-431-11	CARBON	15K	5%	1/4W
R883	1-249-425-11	CARBON	4.7K	5%	1/4W F
		< RELAY >			
RY501	1-515-920-11	RELAY (24V)			
		< TERMINAL >			
TM811	1-537-842-11	TERMINAL BOARD (SPEAKER)			
**********					
*	1-671-609-11	HP BOARD			
		*********			
		< CAPACITOR >			
C681	1-162-294-31	CERAMIC	0.001uF	10%	50V
C682	1-162-294-31	CERAMIC	0.001uF	10%	50V
C683	1-164-159-11	CERAMIC	0.1uF		50V (AEP,UK)
C684	1-164-159-11	CERAMIC	0.1uF		50V
		< JACK >			
J667	1-774-933-11	JACK (LARGE TYPE)(PHONES)			
**********					
*	1-634-461-11	LOADING BOARD			
		**********			
		< CONNECTOR >			
* CN291	1-564-498-11	PIN, CONNECTOR 5P			
		< SWITCH >			
S291	1-571-924-11	SWITCH, LEAF (LOAD OUT)			
S292	1-571-924-11	SWITCH, LEAF (LOAD IN)			

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
*	A-4419-059-A	MAIN BOARD, COMPLETE (AEP,UK)			
		**********			
*	A-4419-070-A	MAIN BOARD, COMPLETE (SP,HK)			
		**********			
*	4-212-590-11	HOLDER (FL)			
		< CAPACITOR >			
C100	1-216-295-91	SHORT	0		
C101	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C102	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C103	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C104	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C105	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C106	1-164-159-11	CERAMIC	0.1uF		50V
C107	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C121	1-126-022-11	ELECT	47uF	20%	10V
C122	1-130-475-00	MYLAR	0.0022uF	5%	50V
C123	1-126-964-11	ELECT	10uF	20%	50V
C126	1-126-963-11	ELECT	4.7uF	20%	50V
C127	1-126-963-11	ELECT	4.7uF	20%	50V
C128	1-126-963-11	ELECT	4.7uF	20%	50V
C129	1-126-964-11	ELECT	10uF	20%	50V
C130	1-136-165-00	FILM	0.1uF	5%	50V
C131	1-126-957-11	ELECT	0.22uF	20%	50V
C132	1-130-479-00	MYLAR	0.0047uF	5%	50V
C134	1-136-165-00	FILM	0.1uF	5%	50V
C135	1-136-165-00	FILM	0.1uF	5%	50V
C137	1-126-961-11	ELECT	2.2uF	20%	50V
C139	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C141	1-126-043-11	ELECT	0.47uF	20%	50V
C142	1-126-963-11	ELECT	4.7uF	20%	50V
C143	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C191	1-164-159-11	CERAMIC	0.1uF		50V
C192	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C193	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C194	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C195	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C196	1-162-294-31	CERAMIC	0.001uF	10%	50V
C197	1-124-995-11	ELECT	220uF	20%	10V
C198	1-164-159-11	CERAMIC	0.1uF		50V
C199	1-124-995-11	ELECT	220uF	20%	10V
C201	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C202	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C203	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C204	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C205	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C221	1-126-022-11	ELECT	47uF	20%	10V
C222	1-130-475-00	MYLAR	0.0022uF	5%	50V
C223	1-130-471-00	MYLAR	0.001uF	5%	50V
C224	1-104-664-11	ELECT	47uF	20%	16V
C226	1-126-963-11	ELECT	4.7uF	20%	50V
C227	1-126-963-11	ELECT	4.7uF	20%	50V
C228	1-126-963-11	ELECT	4.7uF	20%	50V
C229	1-126-964-11	ELECT	10uF	20%	50V
C230	1-136-165-00	FILM	0.1uF	5%	50V
C231	1-126-957-11	ELECT	0.22uF	20%	50V
C232	1-130-479-00	MYLAR	0.0047uF	5%	50V

Ref. No.	Part No.	Description			Remark
C234	1-136-165-00	FILM	0.1uF	5%	50V
C235	1-136-165-00	FILM	0.1uF	5%	50V
C237	1-126-961-11	ELECT	2.2uF	20%	50V
C241	1-126-043-11	ELECT	0.47uF	20%	50V
C242	1-126-963-11	ELECT	4.7uF	20%	50V
C243	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C301	1-124-997-11	ELECT	470uF	20%	10V
C302	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C303	1-124-473-11	ELECT	1000uF	20%	10V
C304	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C305	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C306	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C351	1-104-664-11	ELECT	47uF	20%	16V
C352	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C353	1-162-306-11	CERAMIC	0.01uF	20%	16V
C354	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C401	1-162-294-31	CERAMIC	0.001uF	10%	50V
C402	1-162-294-31	CERAMIC	0.001uF	10%	50V
C403	1-162-306-11	CERAMIC	0.01uF	20%	16V (AEP,UK)
C404	1-162-306-11	CERAMIC	0.01uF	20%	16V (AEP,UK)
C405	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C451	1-126-961-11	ELECT	2.2uF	20%	50V (AEP,UK)
C452	1-162-306-11	CERAMIC	0.01uF	20%	16V (AEP,UK)
C453	1-162-291-31	CERAMIC	560PF	10%	50V (AEP,UK)
C454	1-126-964-11	ELECT	10uF	20%	50V (AEP,UK)
C455	1-162-306-11	CERAMIC	0.01uF	20%	16V (AEP,UK)
C456	1-163-239-11	CERAMIC CHIP	33PF	5%	50V (AEP,UK)
C457	1-163-239-11	CERAMIC CHIP	33PF	5%	50V (AEP,UK)
C701	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C702	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C703	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C704	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C748	1-164-159-11	CERAMIC	0.1uF		50V
C751	1-124-589-11	ELECT	47uF	20%	16V
C752	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C753	1-126-925-11	ELECT	470uF	20%	10V
C754	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C755	1-124-589-11	ELECT	47uF	20%	16V
C756	1-164-159-11	CERAMIC	0.1uF		50V
C757	1-164-159-11	CERAMIC	0.1uF		16V
C758	1-164-159-11	CERAMIC	0.1uF		50V
C759	1-104-905-11	CAPACITOR	0.22F		5.5V
C791	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
* CN101	1-564-506-11	PLUG, CONNECTOR 3P			
CN301	1-770-067-11	CONNECTOR, FFC/FPC 19P			
* CN351	1-564-339-00	PIN, CONNECTOR 5P			
CN401	1-774-289-11	PIN, CONNECTOR (PC BOARD) 15P			
CN701	1-784-601-11	SOCKET, CONNECTOR (NON ZIF)13P			

MAIN

Ref. No.	Part No.	Description	Remark
CN702	1-785-462-11	SOCKET, CONNECTOR (NON-ZIF)11P	
CN703	1-770-380-11	CONNECTOR, BOARD TO BOARD 8P	
CN704	1-770-380-11	CONNECTOR, BOARD TO BOARD 8P	
CN705	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P	
		< DIODE >	
D351	8-719-921-40	DIODE MTZJ-4.7C	
D751	8-719-911-19	DIODE 1SS119-25	
D752	8-719-024-99	DIODE 11ES2-NTA2B	
D753	8-719-911-19	DIODE 1SS119-25	
D755	8-719-911-19	DIODE 1SS119-25	
D791	8-719-914-42	DIODE DA204K	
D792	8-719-914-42	DIODE DA204K	
D793	8-719-914-42	DIODE DA204K	
		< FERRITE BEAD >	
FB301	1-412-473-21	INDUCTOR 0UH	
FB791	1-500-445-21	FERRITE 0UH	
FB792	1-500-445-21	FERRITE 0UH	
		< IC >	
IC101	8-759-494-40	IC M62428AFP600C	
IC102	8-759-300-71	IC HD14053BFP	
IC103	8-759-100-96	IC UPC4558G2	
IC351	8-759-822-09	IC LB1641	
IC451	8-759-560-51	IC BU1924F (AEP,UK)	
IC701	8-759-549-47	IC uPD780018AYGF-015-3BA	
IC791	8-759-549-80	IC P82B715TD.118	
IC951	8-759-635-63	IC M51943BSL	
		< JACK >	
J101	1-766-396-11	JACK, PIN 4P (MD IN/OUT)	
J102	1-779-688-11	JACK, PIN 6P (TAPE,CS/BS IN/OUT)	
		< JUMPER RESISTOR >	
JW301	1-216-295-91	SHORT 0	
JW302	1-216-295-91	SHORT 0	
JW303	1-216-296-91	SHORT 0	
JW304	1-216-296-91	SHORT 0	
JW412	1-216-295-91	SHORT 0	
JW413	1-216-295-91	SHORT 0	
JW701	1-216-296-91	SHORT 0	
JW734	1-216-295-91	SHORT 0	
JW735	1-216-295-91	SHORT 0 (SP, HK)	
JW791	1-216-295-91	SHORT 0	
JW792	1-216-296-91	SHORT 0	
JW793	1-216-296-91	SHORT 0	
JW794	1-216-296-91	SHORT 0	
JW795	1-216-295-91	SHORT 0	
JW796	1-216-296-91	SHORT 0	
JW797	1-216-296-91	SHORT 0	
JW798	1-216-296-91	SHORT 0	
		< COIL >	
L401	1-410-482-31	INDUCTOR 100uH	
L402	1-410-482-31	INDUCTOR 100uH	
L403	1-410-482-31	INDUCTOR 100uH	
L404	1-410-482-31	INDUCTOR 100uH	
L405	1-410-482-31	INDUCTOR 100uH	
		< TRANSISTOR >	
Q103	8-729-900-53	TRANSISTOR DTC114EK	
Q111	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q112	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q121	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q141	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q181	8-729-029-21	TRANSISTOR DTA114ESA-TP	
Q182	8-729-029-21	TRANSISTOR DTA114ESA-TP	
Q183	8-729-029-21	TRANSISTOR DTA114ESA-TP	
Q211	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q212	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q222	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q241	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q450	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q751	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q752	8-729-600-22	TRANSISTOR 2SA1235-F	
Q753	8-729-027-23	TRANSISTOR DTA114EK	
Q781	8-729-027-23	TRANSISTOR DTA114EK	
Q782	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q783	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q791	8-729-025-28	TRANSISTOR 2SK1828	
Q792	8-729-025-28	TRANSISTOR 2SK1828	
		< RESISTOR >	
R101	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R102	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R103	1-216-033-00	METAL CHIP 220 5% 1/10W	
R104	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R105	1-216-105-91	RES,CHIP 220K 5% 1/10W	
R106	1-216-033-00	METAL CHIP 220 5% 1/10W	
R107	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R108	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R109	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R111	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R112	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R113	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R114	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R115	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R116	1-216-093-91	RES,CHIP 68K 5% 1/10W	
R117	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R123	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R124	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R125	1-216-104-00	METAL CHIP 200K 5% 1/10W	
R126	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R127	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R128	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R129	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R130	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R139	1-216-121-91	RES,CHIP 1M 5% 1/10W	
R141	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R142	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R143	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R181	1-247-887-00	CARBON 220K 5% 1/4W	
R183	1-247-887-00	CARBON 220K 5% 1/4W	
R185	1-247-887-00	CARBON 220K 5% 1/4W	

Ref. No.	Part No.	Description			Remark
R191	1-249-413-11	CARBON	470	5%	1/4W F
R192	1-249-413-11	CARBON	470	5%	1/4W F
R193	1-249-413-11	CARBON	470	5%	1/4W F
R201	1-216-077-00	METAL CHIP	15K	5%	1/10W
R202	1-216-073-00	METAL CHIP	10K	5%	1/10W
R203	1-216-033-00	METAL CHIP	220	5%	1/10W
R204	1-216-049-91	RES,CHIP	1K	5%	1/10W
R205	1-216-105-91	RES,CHIP	220K	5%	1/10W
R206	1-216-033-00	METAL CHIP	220	5%	1/10W
R207	1-216-077-00	METAL CHIP	15K	5%	1/10W
R208	1-216-073-00	METAL CHIP	10K	5%	1/10W
R211	1-216-049-91	RES,CHIP	1K	5%	1/10W
R212	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R213	1-216-049-91	RES,CHIP	1K	5%	1/10W
R214	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R215	1-216-097-91	RES,CHIP	100K	5%	1/10W
R216	1-216-093-91	RES,CHIP	68K	5%	1/10W
R217	1-216-089-91	RES,CHIP	47K	5%	1/10W
R223	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R224	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R225	1-216-104-00	METAL CHIP	200K	5%	1/10W
R227	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R228	1-216-081-00	METAL CHIP	22K	5%	1/10W
R229	1-216-121-91	RES,CHIP	1M	5%	1/10W
R230	1-216-073-00	METAL CHIP	10K	5%	1/10W
R241	1-249-421-11	CARBON	2.2K	5%	1/4W F
R242	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R243	1-216-089-91	RES,CHIP	47K	5%	1/10W
R351	1-247-807-31	CARBON	100	5%	1/4W
R401	1-249-417-11	CARBON	1K	5%	1/4W F
R402	1-249-417-11	CARBON	1K	5%	1/4W F
R403	1-216-025-91	RES,CHIP	100	5%	1/10W
R404	1-216-025-91	RES,CHIP	100	5%	1/10W
R405	1-216-025-91	RES,CHIP	100	5%	1/10W
R406	1-216-025-91	RES,CHIP	100	5%	1/10W
R407	1-249-405-11	CARBON	100	5%	1/4W F (AEP,UK)
R408	1-249-429-11	CARBON	10K	5%	1/4W F (AEP,UK)
R409	1-249-417-11	CARBON	1K	5%	1/4W F (AEP,UK)
R410	1-216-073-00	METAL CHIP	10K	5%	1/10W
R411	1-216-073-00	METAL CHIP	10K	5%	1/10W
⚠R451	1-249-401-11	CARBON	47	5%	1/4W F (AEP,UK)
R452	1-216-129-00	METAL CHIP	2.2M	5%	1/10W (AEP,UK)
R453	1-216-049-91	RES,CHIP	1K	5%	1/10W (AEP,UK)
R454	1-249-409-11	CARBON	220	5%	1/4W F (AEP,UK)
R455	1-249-409-11	CARBON	220	5%	1/4W F (AEP,UK)
R456	1-249-441-11	CARBON	100K	5%	1/4W
R457	1-249-441-11	CARBON	100K	5%	1/4W
R701	1-249-425-11	CARBON	4.7K	5%	1/4W F
R702	1-216-109-00	METAL CHIP	330K	5%	1/10W
R704	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R705	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R706	1-216-073-00	METAL CHIP	10K	5%	1/10W
R707	1-216-073-00	METAL CHIP	10K	5%	1/10W
R708	1-216-097-91	RES,CHIP	100K	5%	1/10W
R709	1-216-025-91	RES,CHIP	100	5%	1/10W
R710	1-216-025-91	RES,CHIP	100	5%	1/10W
R711	1-216-025-91	RES,CHIP	100	5%	1/10W
R712	1-216-025-91	RES,CHIP	100	5%	1/10W
R713	1-216-073-00	METAL CHIP	10K	5%	1/10W
R714	1-216-073-00	METAL CHIP	10K	5%	1/10W
R719	1-216-049-91	RES,CHIP	1K	5%	1/10W
R720	1-247-807-31	CARBON	100	5%	1/4W
R721	1-247-807-31	CARBON	100	5%	1/4W
R722	1-247-807-31	CARBON	100	5%	1/4W
R723	1-247-807-31	CARBON	100	5%	1/4W
R724	1-247-807-31	CARBON	100	5%	1/4W
R725	1-247-807-31	CARBON	100	5%	1/4W
R726	1-247-807-31	CARBON	100	5%	1/4W
R727	1-247-807-31	CARBON	100	5%	1/4W
R728	1-216-025-91	RES,CHIP	100	5%	1/10W
R730	1-247-807-31	CARBON	100	5%	1/4W
R731	1-247-807-31	CARBON	100	5%	1/4W
R732	1-247-807-31	CARBON	100	5%	1/4W
R733	1-247-807-31	CARBON	100	5%	1/4W
R735	1-216-097-91	RES,CHIP	100K	5%	1/10W (AEP,UK)
R734	1-216-097-91	RES,CHIP	100K	5%	1/10W
R736	1-216-097-91	RES,CHIP	100K	5%	1/10W
R738	1-247-807-31	CARBON	100	5%	1/4W
R739	1-216-097-91	RES,CHIP	100K	5%	1/10W
R740	1-249-417-11	CARBON	1K	5%	1/4W F
R741	1-216-073-00	METAL CHIP	10K	5%	1/10W
R751	1-249-417-11	CARBON	1K	5%	1/4W F
R752	1-249-425-11	CARBON	4.7K	5%	1/4W F
R753	1-249-437-11	CARBON	47K	5%	1/4W
R754	1-249-437-11	CARBON	47K	5%	1/4W
R755	1-249-429-11	CARBON	10K	5%	1/4W
R756	1-216-025-91	RES,CHIP	100	5%	1/10W
R781	1-216-073-00	METAL CHIP	10K	5%	1/10W
R782	1-216-045-00	METAL CHIP	680	5%	1/10W
R783	1-216-045-00	METAL CHIP	680	5%	1/10W
R791	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R792	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R793	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R794	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
		< VIBRATOR >			
X601	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz)(AEP,UK)			
X701	1-579-233-11	VIBRATOR, CERAMIC (5MHz)			
X702	1-567-098-41	VIBRATOR, CRYSTAL (32kHz)			
**********					
*	A-4419-060-A	PANEL BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C601	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C602	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C603	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PANEL **PANEL-SW** **REG**

Ref. No.	Part No.	Description			Remark
C604	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C605	1-162-290-31	CERAMIC	470PF	10%	50V
C607	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C608	1-164-159-11	CERAMIC	0.1uF		50V
C609	1-164-159-11	CERAMIC	0.1uF		50V
C610	1-162-215-31	CERAMIC	47PF	5%	50V
C611	1-164-159-11	CERAMIC	0.1uF		50V
C612	1-124-589-11	ELECT	47uF	20%	16V
C613	1-128-131-11	ELECT	22uF	20%	50V
		< CONNECTOR >			
* CN601	1-695-374-31	PIN, CONNECTOR (PC BOARD) 13P			
CN603	1-695-372-31	PIN, CONNECTOR (PC BOARD) 11P			
		< DIODE >			
D601	8-719-072-76	DIODE SEL5E23C-TP15 (▷▷Ⅱ/▶▶)			
D602	8-719-072-76	DIODE SEL5E23C-TP15 (Ⅱ◁◁/◀◀)			
D603	8-719-072-76	DIODE SEL5E23C-TP15 (□)			
D604	8-719-072-76	DIODE SEL5E23C-TP15 (▷Ⅱ)			
D605	8-719-058-04	DIODE SEL5223S-TP15 (◴)			
D606	8-719-056-13	DIODE SML72423C-TP4 (⏻)			
		< FLUORESCENT INDICATOR >			
FL601	1-517-805-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC601	8-759-572-22	IC MSM9202-02GS-KR1			
IC602	8-759-459-85	IC NJL63H400A			
		< TRANSISTOR >			
Q601	8-729-900-53	TRANSISTOR DTC114EK			
		< RESISTOR >			
R601	1-216-025-91	RES,CHIP	100	5%	1/10W
R602	1-216-025-91	RES,CHIP	100	5%	1/10W
R603	1-216-025-91	RES,CHIP	100	5%	1/10W
R604	1-216-025-91	RES,CHIP	100	5%	1/10W
R605	1-249-437-11	CARBON	47K	5%	1/4W
R606	1-247-843-11	CARBON	3.3K	5%	1/4W
R607	1-216-029-00	METAL CHIP	150	5%	1/10W
R608	1-216-029-00	METAL CHIP	150	5%	1/10W
R609	1-249-413-11	CARBON	470	5%	1/4W F
R610	1-249-413-11	CARBON	470	5%	1/4W F
R611	1-249-411-11	CARBON	330	5%	1/4W
R612	1-216-029-00	METAL CHIP	150	5%	1/10W
R613	1-216-029-00	METAL CHIP	150	5%	1/10W
R621	1-249-413-11	CARBON	470	5%	1/4W F
R622	1-249-415-11	CARBON	680	5%	1/4W F
R623	1-249-417-11	CARBON	1K	5%	1/4W F
R624	1-249-419-11	CARBON	1.5K	5%	1/4W F
R631	1-249-413-11	CARBON	470	5%	1/4W F
R632	1-249-415-11	CARBON	680	5%	1/4W F
R633	1-249-417-11	CARBON	1K	5%	1/4W F
		< SWITCH >			
S621	1-762-875-21	SWITCH, KEYBOARD (⏏)			
S622	1-762-875-21	SWITCH, KEYBOARD (▷▷Ⅱ/▶▶, TUNING +)			
S623	1-762-875-21	SWITCH, KEYBOARD (Ⅱ◁◁/◀◀, TUNING -)			
S624	1-762-875-21	SWITCH, KEYBOARD (□)			
S625	1-762-875-21	SWITCH, KEYBOARD (▷Ⅱ)			
S631	1-762-875-21	SWITCH, KEYBOARD (I/⏻)			
S632	1-762-875-21	SWITCH, KEYBOARD (DISPLAY)			
S633	1-762-875-21	SWITCH, KEYBOARD (FUNCTION)			
S634	1-762-875-21	SWITCH, KEYBOARD (TUNER/BAND)			
**********					
*	1-671-617-11	PANEL-SW BOARD			
		**********			
		< SWITCH >			
S699	1-771-516-11	SWITCH, PUSH(DETECTION)(1 KEY)			
**********					
*	A-4419-068-A	REG BOARD, COMPLETE			
		**********			
		< FUSE >			
⚠F941	1-532-465-31	FUSE (T3.15AL/250V)			
⚠F942	1-532-465-31	FUSE (T3.15AL/250V)			
		< CAPACITOR >			
C921	1-126-767-11	ELECT	1000uF	20%	16V
C922	1-164-159-11	CERAMIC	0.1uF		50V
C923	1-126-964-11	ELECT	10uF	20%	50V
C924	1-164-159-11	CERAMIC	0.1uF		50V
C925	1-126-964-11	ELECT	10uF	20%	50V
C941	1-126-934-11	ELECT	220uF	20%	16V
C942	1-126-933-11	ELECT	100uF	20%	16V
C943	1-164-159-11	CERAMIC	0.1uF		50V
C944	1-126-933-11	ELECT	100uF	20%	16V
C945	1-124-995-11	ELECT	220uF	20%	10V
C946	1-126-934-11	ELECT	220uF	20%	16V
C947	1-124-995-11	ELECT	220uF	20%	10V
C948	1-164-159-11	CERAMIC	0.1uF		50V
C949	1-164-159-11	CERAMIC	0.1uF		50V
C951	1-126-940-11	ELECT	330uF	20%	25V
C952	1-126-967-11	ELECT	47uF	20%	50V
C953	1-164-159-11	CERAMIC	0.1uF		50V
C954	1-162-306-11	CERAMIC	0.01uF	20%	16V
		< CONNECTOR >			
* CN942	1-564-522-11	PLUG, CONNECTOR 7P			
CN943	1-770-405-11	CONNECTOR, BOARD TO BOARD 8P			
CN944	1-770-405-11	CONNECTOR, BOARD TO BOARD 8P			
CN945	1-506-481-11	PIN, CONNECTOR 2P			
		< DIODE >			
D921	8-719-210-21	DIODE 11EQS04			
D922	8-719-210-21	DIODE 11EQS04			
D941	8-719-210-21	DIODE 11EQS04			
D942	8-719-210-21	DIODE 11EQS04			
D943	8-719-210-21	DIODE 11EQS04			
D944	8-719-210-21	DIODE 11EQS04			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
D945	8-719-986-04	DIODE HZS9A1LTA			
D946	8-719-986-04	DIODE HZS9A1LTA			
D952	8-719-986-26	DIODE HZS12A3LTA			
		< GROUND TERMINAL >			
EPT941	1-537-770-21	TERMINAL BOARD, GROUND			
		< FUSE HOLDER >			
FH941	1-533-293-11	FUSE HOLDER			
FH942	1-533-293-11	FUSE HOLDER			
FH943	1-533-293-11	FUSE HOLDER			
FH944	1-533-293-11	FUSE HOLDER			
		< IC >			
IC921	8-759-231-53	IC TA7805S			
IC922	8-759-373-82	IC TA7807SB			
		< TRANSISTOR >			
Q941	8-729-140-96	TRANSISTOR 2SD774-34			
Q942	8-729-040-20	TRANSISTOR RT1P137L-TP			
Q943	8-729-029-66	TRANSISTOR DTC114ESA			
Q951	8-729-202-67	TRANSISTOR 2SK246-GR3			
Q952	8-729-026-68	TRANSISTOR 2SD2525(TP)			
		< RESISTOR >			
R925	1-249-411-11	CARBON	330	5%	1/4W
R941	1-247-843-11	CARBON	3.3K	5%	1/4W
		< THERMISTOR(POSITIVE) >			
THP941	1-801-671-11	THERMISTOR, POSITIVE			
THP942	1-801-671-11	THERMISTOR, POSITIVE			

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*	A-4419-065-A	SUB-TRANS BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C901	1-126-935-11	ELECT	470uF	20%	16V
C902	1-126-933-11	ELECT	100uF	20%	16V
C903	1-113-925-11	CERAMIC	0.01uF	20%	250V
C904	1-164-159-11	CERAMIC	0.1uF		50V
C962	1-128-576-11	ELECT	100uF	20%	63V
C963	1-164-159-11	CERAMIC	0.1uF		50V
C964	1-126-948-11	ELECT	100uF	20%	35V
		< CONNECTOR >			
* CN901	1-564-687-11	PIN, CONNECTOR 3P			
CN902	1-779-939-11	CONNECTOR, BOARD TO BOARD 7P			
		< DIODE >			
D901	8-719-210-21	DIODE 11EQS04			
D902	8-719-210-21	DIODE 11EQS04			
D903	8-719-210-21	DIODE 11EQS04			
D904	8-719-210-21	DIODE 11EQS04			
D905	8-719-911-19	DIODE 1SS119-25			
D906	8-719-911-19	DIODE 1SS119-25			
D961	8-719-024-99	DIODE 11ES2-NTA2B			

Ref. No.	Part No.	Description			Remark
D962	8-719-024-99	DIODE 11ES2-NTA2B			
D963	8-719-024-99	DIODE 11ES2-NTA2B			
D964	8-719-024-99	DIODE 11ES2-NTA2B			
D965	8-719-986-67	DIODE HZS33-2LTA			
D966	8-719-921-37	DIODE MTZJ-4.7			
		< IC >			
IC901	8-759-373-79	IC TA7805SB			
		< TRANSISTOR >			
Q901	8-729-029-66	TRANSISTOR DTC114ESA			
Q961	8-729-118-01	TRANSISTOR 2SB1116-K			
Q962	8-729-040-19	TRANSISTOR RT1N137L-TP			
Q963	8-729-040-19	TRANSISTOR RT1N137L-TP			
Q964	8-729-040-19	TRANSISTOR RT1N137L-TP			
Q965	8-729-029-21	TRANSISTOR DTA114ESA-TP			
Q966	8-729-029-21	TRANSISTOR DTA114ESA-TP			
		< RESISTOR >			
R901	1-249-429-11	CARBON	10K	5%	1/4W
⚠R961	1-217-637-00	FUSIBLE	1	5%	1/4W F
R962	1-249-429-11	CARBON	10K	5%	1/4W
R964	1-249-429-11	CARBON	10K	5%	1/4W
R965	1-247-807-31	CARBON	100	5%	1/4W
R966	1-247-807-31	CARBON	100	5%	1/4W
R967	1-247-807-31	CARBON	100	5%	1/4W
R968	1-249-428-11	CARBON	8.2K	5%	1/4W F
R969	1-249-441-11	CARBON	100K	5%	1/4W
		< RELAY >			
RY901	1-755-276-11	RELAY, POWER			
		< TRANSFORMER >			
⚠T901	1-433-476-11	TRANSFORMER, POWER			

****

*	1-671-615-11	TRANS BOARD			
		**********			
		< CONNECTOR >			
* CN991	1-580-230-31	PIN, CONNECTOR (PC BOARD) 2P			
* CN992	1-568-226-11	PIN, CONNECTOR 2P			
* CN994	1-564-522-11	PLUG, CONNECTOR 7P			
		< FUSE >			
⚠F991	1-532-465-31	FUSE (T3.15AL/250V)			
		< DIODE >			
D951	8-719-024-99	DIODE 11ES2-NTA2B			
D953	8-719-024-99	DIODE 11ES2-NTA2B			
		< FUSE HOLDER >			
FH991	1-533-293-11	FUSE HOLDER			
FH992	1-533-293-11	FUSE HOLDER			

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Replace only with part number specified.

TRANS **VOLUME**

Ref. No.	Part No.	Description			Remark
		< THERMISTOR(POSITIVE) >			
THP944	1-801-726-11	THERMISTOR, POSITIVE			
THP945	1-801-726-11	THERMISTOR, POSITIVE			
**********					
*	1-671-610-11	VOLUME BOARD			
		**********			
		< CAPACITOR >			
C691	1-162-306-11	CERAMIC	0.01uF	20%	16V
C692	1-162-306-11	CERAMIC	0.01uF	20%	16V
		< CONNECTOR >			
* CLP691	1-690-880-31	LEAD (WITH CONNECTOR)			
		< SWITCH >			
S691	1-418-012-11	ENCODER, ROTARY (VOLUME)			
**********					
		MISCELLANEOUS			
		**********			
15	1-769-940-11	WIRE (FLAT TYPE) (11 CORE)			
16	1-769-972-11	WIRE (FLAT TYPE) (13 CORE)			
53	1-790-305-11	WIRE (FLAT TYPE) (19 CORE)			
54	1-693-408-11	TUNER			
⚠57	1-575-651-91	CORD, POWER			
60	1-773-108-11	WIRE (FLAT TYPE) (19 CORE)(100mm)			
⚠65	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK,HK)			
⚠255	8-848-379-31	OPTICAL PICK-UP KSS-213B/S-N			
256	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)			
⚠CN904	1-526-794-11	OUTLET, AC			
FL601	1-517-805-11	INDICATOR TUBE, FLUORESCENT			
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)			
M102	X-4917-504-1	MOTOR ASSY (SLED)			
M551	1-698-997-21	FAN, D.C.			
M904	A-4660-307-A	MOTOR (L) ASSY			
⚠T991	1-433-478-11	TRANSFORMER, POWER			
**********					
		**********			
		HARDWARE LIST			
		**********			
#1	7-685-871-01	SCREW +BVTT 3X6 (S)			
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S			
#4	7-684-024-04	N 4, TYPE 2			
#5	7-682-562-09	SCREW +B 4X10			
#6	7-624-105-04	STOP RING 2.3, TYPE -E			
#7	7-685-234-19	SCREW +KTP 2.6X8 TYPE2NON-SLIT			
#8	7-621-775-10	SCREW +B 2.6X4			

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